WATER RESOURCES

THE UNIVERSITY
OF MICHIGAN

JUL 8 1960

MAIN
READING ROOM

U.S. Congress
Senate

HEARING

BEFORE THE

SELECT COMMITTEE ON NATIONAL WATER RESOURCES UNITED STATES SENATE

EIGHTY-SIXTH CONGRESS

SECOND SESSION

PURSUANT TO

S. Res. 48

COLUMBIA, S.C., MAY 13, 1960

PART 21

Printed for the use of the Select Committee on National Water Resources

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1960

46186

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(Pursuant to S. Res. 48, 86th Cong.)

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WATER RESOURCES

FRIDAY, MAY 13, 1960

U.S. SENATE,
SELECT COMMITTEE ON NATIONAL WATER RESOURCES,
Columbia, S.C.

The select committee met at 9 a.m., pursuant to Senate Resolution 48, in the Capitol Room of the Wade Hampton Hotel, Columbia, S.C., Hon. Robert S. Kerr (chairman) presiding.

Committee members present: Senators Kerr, Schoeppel, and Martin.

Present also: Senator Johnston of South Carolina; Theodore M. Schad, staff director of the select committee; and Paul McBride, chief clerk.

The CHAIRMAN. Speaking for myself and the rest of the committee, may I say that we are all very happy to be in Columbia. We are here to learn of your problems in connection with insuring an adequate supply of unpolluted water to enable this great State to have its normal growth and development in the two decades ahead of us. We have sought this information from over 20 other States directly, and the others indirectly, and have come up with some valuable information for committee consideration.

Experts in the Bureau of the Census tell us that our population will increase from 75 million to 90 million in the next 20 years. Industrial engineers tell us that our gross national product could double in the next 20 to 25 years. This increase in our agricultural and industrial production will, in turn, greatly increase the requirements for water.

We hope that after all of the hearings are concluded and all of the information gathered, we will be able to report to the Senate of the United States by January what the requirements of our country for additional supplies of water will be in the next two decades and immediately thereafter, where the needs will exist, and how, with the supplies available to us, the needs can be met.

With me here on the committee is Senator Schoeppel of Kansas and Senator Martin of Iowa, who will be with us in a few moments.

We are honored to be in the home State of Senator Olin Johnston and Senator Thurmond, two of our most distinguished and respected colleagues in the Senate.

After we have had a word from Senator Schoeppel and then later from Senator Martin, Senator Johnston will present his statement before the committee and call for testimony from the witnesses he has arranged to be heard.

STATEMENT BY HON. ANDREW F. SCHOEPPEL, U.S. SENATOR FROM THE STATE OF KANSAS

Senator SCHOEPPEL. Mr. Chairman, and our distinguished colleague here, your senior Senator from your great State, Olin Johnston, and ladies and gentlemen, I am delighted, of course, to be down here to attend this important hearing on water resources needs.

It was when I was Governor of my State (and, by the way, Bob and I were Governors of our respective States together), that I had my first opportunity to become well acquainted at the Governors' conference with your distinguished senior Senator, who was then Governor of your great State. This is a working session, as the chairman has already pointed out to you, and I am glad to be here as a member of this committee to hear about your water problems, a most important subject.

As the chairman has said, we hope, as a result of these meetings, to bring forth a constructive report, which will point the problems facing the Nation and suggest means of solving them, so that our future progress will be assured.

The CHAIRMAN. With us on our work we have a very fine staff, some of whom are here. I would like to present our director, Mr. Ted Schad, and maybe he will present other members of the staff that are here.

Mr. SCHAD. I would like to introduce the chief clerk of the committee, Mr. Paul McBride. This hearing has been arranged for us by your own two Senators from South Carolina, and two of the members of their staffs, Tom Chadwick and Fred Buzhardt, who have made the detailed arrangements, are here today. Mr. Buzhardt is with Senator Thurmond. Mr. Chadwick is with Senator Johnston. We also have with us Mr. Chris Sylvester, with Senator Young of North Dakota. Senator Kerr has his staff assistant, Miss Malvina Stephenson here and Miss Roba Holt, his secretary. Also, we have Col. Stanley Kimmett, of the general staff of the Army, who has made the transportation arrangements for most of the trips the committee has taken.

The CHAIRMAN. Thank you, Mr. Schad.

We have a letter from your distinguished Governor which will go into the record at this point.

(The letter follows:)

STATE OF SOUTH CAROLINA,
EXECUTIVE DEPARTMENT,
Columbia, May 9, 1960.

Hon. ROBERT S. KERR,
Chairman, Select Committee on National Water Resources,
U.S. Senate, Washington, D.C.

DEAR SENATOR KERR: I sincerely regret that a long-standing commitment in another State will prevent my attending the meeting of the Senate Select Committee on National Water Resources in Columbia on Friday, May 13. I am happy, however, that my executive secretary, M. O. J. Kreps III, will read my statement in my absence. I would appreciate it if you would have my statement and this letter included as a part of the record of the hearings held in Columbia.

With kind regards.

Sincerely,

ERNEST F. HOLLINS, *Governor.*

The CHAIRMAN. Senator Johnston.

STATEMENT OF HON. OLIN D. JOHNSTON, U.S. SENATOR FROM THE STATE OF SOUTH CAROLINA

Senator JOHNSTON. Chairman Kerr, and other Senators who are here today, I want to speak for the people of South Carolina when I say that we are especially proud to have you come down here with your committee to be with us to study the water problems of our area.

I think, after you hear the list of witnesses that we will have today, you will find out that we are very much interested in the subject of water resources here in South Carolina.

South Carolinians are in agreement that we want to see our water used in the most practical manner for the benefit of all the people and in such a way that we will be able to prevent the water shortages that have harassed other areas of the Nation and, at the same time prevent the flooding which has brought disaster to so many other States of our great Nation. Almost every year we hear where millions of dollars have been washed away on account of floods.

I shall give no testimony today before the committee in order to conserve time. We have a long list of outstanding witnesses that we hope to hear, and we are going to have to expedite the time as much as possible in order to hear them.

I have been asked by Gov. Ernest F. Hollings to announce that, due to a previously longstanding engagement, it is impossible for him to be with us today. He is away on State business, but he will be represented at the hearing this morning by Mr. Muller Kreps, his executive secretary, who will be heard later.

At this time I would like to also explain that we probably would have had the complete congressional delegation from South Carolina present for this hearing except that some of our representatives had important committee business coinciding with this hearing date and could not be with us.

I know Congressman Mendel Rivers was planning to be with us here today, but due to some hearings that he had to hold in Washington it was impossible for him to leave there.

Congressmen McMillan, Dorn, Ashmore, and Hemphill would have also been with us, but they have important business in Washington.

Senator Thurmond, who is represented here today by Mr. Fred Buzhardt, a member of his staff, also could not be with us because of a previous engagement.

Congressman John J. Riley, the host Congressman from this district, has asked me to explain that, as a member of the House Appropriations Committee, he is tied up this week end on money matters concerning South Carolina. In particular, he is looking after appropriations regarding the South Carolina State Ports Authority, the Gill Creek water study which is of particular interest to Columbians, appropriations relative to the study of navigation on the Congaree River, and also maintenance funds for Charleston Harbor. All these matters are before him this week end, so he regretted that he could not be with us.

Again, I welcome everyone to this hearing, and I express my sincere appreciation to Chairman Kerr for granting us this hearing in South Carolina, and to the other members of the committee who are with us today. You know, not every State is having this privilege that

we are having, to come and really give our side of the picture to him and his committee. It is impossible for the committee to go to every State in the Union.

I feel sure the committee and the Congress will receive great benefit from the testimony given here today by people of my State who are sincerely devoted to the protection of our water resources against careless handling, waste, and pollution. Our very economic well-being hinges on our intelligent conduct in the matter of water resources.

So this, in my mind, is a very important matter and as you travel around this world and as you travel throughout this Nation of ours you find that where water resources are protected that section prospers.

We are really grateful that God has given to us a little bit of advantage over some sections, even of the United States, in regard to water. But that is no reason why we should not protect this God-given right just because at the present time we may be in a little better position than some other sections. We want to watch this because as the population increases and as our national economy increases there is going to be more demand for more and purer water throughout the Nation.

So we thank you for coming here today and listening to the witnesses that we will have to come before you and we believe they will bring to you something worthwhile.

I notice we have here as the first witness U.S. Senator Strom Thurmond, or his representative.

I think Mr. Buzhardt is here.

The CHAIRMAN. Come around, Mr. Buzhardt.

STATEMENT OF FRED BUZHARDT, ON BEHALF OF HON. STROM THURMOND, U.S. SENATOR FROM THE STATE OF SOUTH CAROLINA

Mr. BUZHARDT. Mr. Chairman and gentlemen of the committee, Senator Thurmond asked me to read a very brief statement for him. [Reading:]

Mr. Chairman and members of the committee, I sincerely regret that a previously scheduled military conference prevents my attendance at the hearing of this committee in Columbia.

I would like to express my appreciation for the scheduling of this hearing in South Carolina. South Carolina is fortunate to have a plentiful supply of rainfall and is blessed with great water resources throughout the State.

Only a few years ago it would have been difficult to anticipate that the need of South Carolina for water would have ever exceeded the supply. You will find among South Carolinians now, however, a consciousness of the necessity for conservation of our water resources, for demands upon these resources in recent years have multiplied, and it is clear that the future continued development of our State is contingent on the conservation and proper utilization of the water resources with which we are so richly blessed.

I know that you will conclude from the testimony given today that much thought and consideration has been given to the conservation of water resources by both State and private agencies and individuals in South Carolina and the Southeast.

Senator JOHNSTON. The next witness is from Gov. Ernest F. Hollings' office. His representative, I think, is Mr. Muller O. J. Kreps.

STATEMENT OF MULLER O. J. KREPS, ON BEHALF OF HON. ERNEST F. HOLLINGS, GOVERNOR OF THE STATE OF SOUTH CAROLINA

Mr. KREPS. Senator Kerr, Senator Schoeppel, and Senator Johnston, I am Muller Kreps, executive secretary to Governor Hollings. He asked me to convey his welcome to you, as well as his regret at not being able to be with us today.

We in South Carolina are not a superstitious lot. Instead, we feel that today, Friday the 13th, is a most fortunate one for us, indeed, to have you and your committee with us. We are honored by your visit, sir.

I would like at this time to read this brief statement of Governor Hollings. [Reading:]

We are highly gratified that Columbia was chosen for the location of one of the important hearings. We appreciate the opportunity to appear before you to give our views on water resources and water uses and the many problems concerning this vital resource as it affects this area.

You will no doubt hear many statements today concerning the tremendous importance of water in the United States. The importance of water is being more clearly recognized because of the unprecedented growth of the economy. Increased population and the many uses for water being developed daily make it a timely moment for these hearings to be held.

The formation of this committee is to me highly significant and I take this opportunity to commend Senator Kerr and his committee and staff for the thorough and comprehensive approach which they are taking to this all important assignment. I have followed with interest the other hearings which this committee has conducted throughout the United States and I am quite impressed with the great attention being shown in the work of this committee and in the valuable information being offered at these hearings. While water problems vary from State to State, I am confident that the valuable testimoney presented here and at the other hearings by interested citizens will prove invaluable in the committee's objective of planning now for the effective and intelligent use of our water.

South Carolina is in a remarkably fortunate position for water supply. Technical experts will cite data on the tremendous flow of water in our great rivers and in our ground water supplies in most sections of the State. We of South Carolina have not experienced the water shortage which has plagued so many of our less fortunate States. Even so, however, we have begun making plans to protect our great water resources and to utilize them wisely and efficiently. Certainly it is our most important asset in developing our economy which is a prime objective of my administration.

In 1953 a special Water Policy Committee was formed by the General Assembly to study and make recommendations for water policy for the State of South Carolina. The comperhensive and thorough study utilized the experience and thinking of many individuals and organizations interested in water for agricultural, municipal, industrial, and recreational purposes. The committee report outlined the quantity and quality of our water resources, water usage by industry, agriculture, municipalities, and others and many other facets of the subject.

The committee proposed a water policy for the conservation, control, and regulation for the use, development, diversion, and appropriation for the surface waters of the State. The proposal failed to be enacted into law in the 1954 session.

Since then there has been increasing concern among South Carolinians for proper planning for the present and future use of our water. In my address to the general assembly on January 12 of this year, I made the following statement:

"More and more each year I am convinced the greatest natural resource we have is water. It is important to all segments of our people and economy. Since we have an abundance, there has been no need for regulation. However, experience indicates that when the need arises, it is too late to regulate without extreme hardship. Ordinary foresight could be exercised by this legislature in instituting a fair and firm water policy. In order to facilitate this, the director

of the Water Pollution Control Authority has been designated to hold hearings and make recommendations to the general assembly so that a good water policy can be adopted."

Again, interested groups were consulted and recommendations for a water policy were solicited. It was found that there is disagreement concerning the best water policy but there was a unanimity of opinion that a State agency should accumulate more technical data on our water resources and uses and projections made for future short and long range needs. It was further strongly recommended that this and other responsibilities related to the State's water resources should not be the responsibility of the Federal Government.

I am therefore prepared to propose to the general assembly the establishment of the State water resources board to coordinate all of the State's water resources activities, such as: use and development of streams and rivers, quantity and quality control, water pollution control, negotiations with Federal and other Sate governments and other responsibilities which may be assigned. It would perform the necessary research for the Governor's office and for the general assembly and would administer policies as they are determined. The board would also devise plans and policies and carry out a program of education concerning the most beneficial long-range conservation and use of the water resources of the State. This would be done by designating the present water pollution control authority as the State water resources board so that the water pollution control authority will continue its activities as now constituted.

We in South Carolina feel strongly that administration of our water resources is a matter for the State and not the Federal Government. We believe that we know more about our problems concerning water here at the local level than any individual or group in Washington. We are making an intelligent, concerted effort to seek the solution to water resource problems in South Carolina and to plan effectively for our future needs and uses. Water plays such a vital role in our economy that we must be left free to plan its uses to the maximum benefit to our citizens and to our economy.

We are experiencing a problem along these lines now with several additional dams being proposed on the Savannah River. We strenuously oppose the proposed dams because we feel that our best interests can be served by having the Savannah River remain a free-flowing body so that the water can be best used for agricultural and industrial purposes. Not only would the proposed dams remove valuable industrial sites but it precludes effective use of the river for qualified industrial effluents. Not only has the general assembly opposed these proposals but also numerous organizations and individuals.

We appreciate the opportunity for the people of our State to present their views to this committee and we trust that you will see fit to recommend the reaffirmation of the delegation of authority to the States to allocate and control water and to fully recognize the administration of water resources as a local responsibility.

Thank you, Mr. Chairman.

The CHAIRMAN. All right, Mr. Kreps.

Senator JOHNSTON. The next witness is Walter W. Harper, director of the State development board.

STATEMENT OF M. R. FRIERSON, ON BEHALF OF WALTER W. HARPER, DIRECTOR, STATE DEVELOPMENT BOARD, COLUMBIA, S.C.

Mr. FRIERSON. Mr. Chairman and members of the select committee, I am not Walter W. Harper, but I am here representing him and also another member of our staff who was delegated originally to appear before this committee, Richard R. Sackett.

Mr. Harper is out of the city and out of the State, in fact, on State business and Mr. Sackett is ill in this very hotel.

The CHAIRMAN. Your name?

Mr. FRIERSON. My name is Manton R. Frierson, sir.

The CHAIRMAN. Thank you.

Mr. FRIERSON. I have a brief statement which I would like to read to the committee, and to those gathered here.

The State development board, which is charged with furthering the economic growth of South Carolina, is especially concerned with the attraction of new industries into the State so that jobs will be created, the State's resources utilized, standards of living raised, and bases of taxation broadened for the common good.

The main purpose of this effort, as stated, is to strengthen the economy of the State, to provide more jobs for our people, and to increase our per capita income generally.

There is no more vivid reflection of the challenge we face in this program than the number of new jobs which we must create annually to keep pace with growth requirements.

South Carolina's welcome to new industry is both personal and official. In addition to a general warmth in the attitude of our people, all levels of government have acted officially to translate this attitude into action. Our State is dotted with hometown development groups especially designed to work with industry. These hometowns have been busily improving their industrial attractiveness, zoning for industry, analyzing sites and facilities, providing utilities, providing means for financing, improving the educational, cultural and recreational facilities, and in many other ways making ready and extending invitations to prospective industry.

Therefore, the State development board is tremendously interested in South Carolina's water resources as a whole and as these resources concern the communities throughout the State to which prospective industry is looking to meet its requirements in the establishment of new plants.

As you are aware, industrial sites with ample water supplies are in great demand by industry and the number of such available sites decreases as new industries take up these desirable locations. Desirable industrial sites are lost as well when large areas become flooded by Federal projects. The State development board is vitally interested in seeing that these excellent industrial sites throughout the State be preserved so that water-using industries may be attracted into the State.

We fully realize the importance of water resources development and all its facets—navigation, irrigation, flood control, hydroelectric power and others. We are, however, deeply concerned with the water resources problems of the local communities and their economic future which will more and more depend on their industrial expansion.

The State development board heartily endorses any plans that propose indications of the positive protection of the economic potential of the communities within the State of South Carolina—for in the final analysis it is these people who give so unstintingly of their time and energy and are so unified in their efforts that the economic development of the entire State of South Carolina becomes greater and greater.

Thank you very much, gentlemen.

Senator JOHNSTON. Mr. T. Carlisle Crump, administrative assistant, South Carolina Ports Authority, Charleston, S.C.

Is Mr. Crump here?

Mr. KREPS. I do not believe he has shown up yet, Senator.

Senator JOHNSTON. W. T. Linton.

STATEMENT OF W. T. LINTON, EXECUTIVE DIRECTOR, WATER POLLUTION CONTROL AUTHORITY OF THE SOUTH CAROLINA STATE BOARD OF HEALTH

Mr. LINTON. Senator Kerr, Senator Johnston, my name is W. T. Linton.

I would like to add my welcome to those already expressed at the opportunity of having you here and welcome each member of this committee and to say we are extremely pleased and honored to have you here.

I address your honorable and distinguished group as director of the South Carolina Water Pollution Control Authority and director of the Division of Sanitary Engineering of the South Carolina State Board of Health.

First, I wish to express my appreciation for the opportunity of being heard by a group dedicated to the tremendous task of formulating recommendations for legislative action concerning our natural water resources which are in such imminent danger of becoming, if indeed they are not already dislocated by population shift, misused by indiscriminate application, mismanaged by apathy, and unavailable by misappropriation.

Pollution control is an expensive undertaking. Yet the expenditures that are necessary to accomplish this task can, and must be justified by the maintenance of generally satisfactory health conditions, and also from the economic benefits which will be derived therefrom. Pollution control must be a generally accepted philosophy in municipal and industrial activity—whatever the cost may be. Here is a tremendous obligation for research, designed to develop appropriate and acceptable waste treatment processes within the range of abilities to pay.

The question of water supply has long been of concern to the State health departments throughout the United States. South Carolina is no exception. The health officer of this State is charged with the responsibility of the inspection of watersheds and the bacteriological examinations of all public water supplies within South Carolina. This direction, by law, carries with it the supervision of both surface and underground waters as to chemical and bacteriological purity and, of course, dilution being a limiting relationship in the concentration of these factors, quantity must receive consideration.

The programs of water supply and water pollution control are administered in South Carolina by agencies which were created by legislative acts, charging the commissions so created with the responsibility of preserving the public health and welfare. Your committee, Mr. Chairman, is charged with developing recommended legislation which is designed to accomplish essentially the same objectives on a nationwide basis, with certain other specific additions which might be beyond our official authority, but certainly not beyond our unofficial and specific interest.

It appears to me that the most critical aspect in the entire matter of water resources is the lack of visionary planning, based on a foundation supported by the collection and evaluation of basic data. Such planning can be accomplished today and for the future only through a cooperative effort of all users, predicated on a recognition and understanding of the problem as it affects all interests.

To undertake and to accomplish this important phase of our water resources development program, we suggest that consideration be given by your committee to the possibility of expanding the potential of the already established U.S. Public Health Service to the degree that it can cooperate with the States of the Nation, and such interstate agencies which now exist or may be created, in the production of a plan for the orderly development of the water resources of this country. The experiences of the various States of the Nation with the U.S. Public Health Service would assure general cooperation with that agency in such a comprehensive undertaking.

We also suggest that any legislation which you recommend for congressional consideration include authorization to the U.S. Public Health Service for the expansion, and this is important, into the States of its research activities in the fields of water supply and waste treatment to a degree commensurate with the water problems confronting the United States.

One thing further, Mr. Chairman, I am sure that you do not intend, by your recommendations, to infringe on any water rights now enjoyed by the people of South Carolina or other States of the Union. We request simply and with conviction that nothing be done in Congress because of the recommendations of the select committee which would in any way restrict the beneficial uses of the waters in the State by its citizens.

Thank you very much for the opportunity of making this statement.

Senator JOHNSTON. Thank you, Mr. Linton.

Mr. LINTON. Thank you.

Senator JOHNSTON. Mrs. J. L. Wiggins, president, League of Women Voters of South Carolina.

STATEMENT OF MRS. J. L. WIGGINS, PRESIDENT, LEAGUE OF WOMEN VOTERS OF SOUTH CAROLINA

Mrs. WIGGINS. I am Mrs. J. L. Wiggins of Hartsville, S.C., president of the League of Women Voters of South Carolina.

The league is, as you know, a group of women seeking to promote active participation in government by informed citizens. We are not experts; we are nonpartisan; we support policies, never individuals.

In the 4 years that we have been studying water resources, with special emphasis last year on the Catawba River Basin, we have come to realize that the increasing use of water by an expanding population and a rapidly developing economy makes planning necessary. That water resources may be developed fully and that all water users may be served equitably, the league believes that planning and development should be multipurpose and basinwide or regional.

Water development already existing in this State represents efforts to meet needs (often single purpose needs) by diverse interests, so that obviously, conflicts occur. Our first requirement, therefore, is a comprehensive study of the water resources of the State as related to the multipurpose development of our several river basins. In this study the people should participate through their various organizations. We would support a study commission similar to the U.S. Study Commission, Southeast River Basins, now at work under the chairmanship of James W. Woodruff, Jr., on the river basins of Georgia,

with representation from Alabama, Florida, and South Carolina. Such a study would need to include North Carolina, as our great rivers rise in the States to the north of us, and the Commission, like its counterpart, would be composed of representatives of the several Federal, State, and local agencies, together with the public and private interests involved.

In this way we could formulate a policy for the State of South Carolina which would be acceptable to the grassroots and which would coordinate with the water policy of the United States toward which the proposed Conservation and Resources Act of 1960 (S. 2549) is moving. This bill has the support of the league.

We could then hope to develop a coordinating device suitable to our region which would do for the Southeastern States what the proposed Northeastern Water and Related Land Resources Compact would do for the New England States in the way of regional planning and management.

Our rivers have such an abundant flow that we have been slow to realize the necessity of water management. But conflicts are arising between the needs of water users who begin to feel the pinch when streamflow is reduced by a drought, or where the temporarily idle turbines of the hydroelectric plant release insufficient water. The latter situation is aggravated by the rapidly increasing use of steam plants with hydroelectric power reserved for "peaking."

Our generous water supply has already attracted several Federal and numerous industrial plants—in fact, we are presently in the midst of a great industrial development—so that the problem of pollution from waste of all types becomes increasingly serious. As water is the key to our economy, can we afford to destroy our water by pollution?

The recreational value of South Carolina's streams and parks must also be considered. The league believes that our State's wonderful assets of game, fishing and outdoor vacationing are a real economic advantage which we will want to take into account in planning our future development.

South Carolina's recently appointed water policy study group, under the chairmanship of W. T. Linton, will be considering water supply, pollution abatement, and recreational use of State waters. The League of Women Voters of South Carolina hopes that the findings of the water policy study group will be available for use by a U.S. study commission, if such a body is established, as a part of its regional review. The league is convinced that in the planning and development of water resources the needs and potentialities of the entire basin or region should be considered.

This State has such large potentialities for greater water development of interest to South Carolina, to the Southeast and to the United States that we heartily commend you and your committee, Senator Kerr, for giving special attention to our problems in your broad study of the future needs of our country in the field of water development.

I thank you for the opportunity to present this statement.

The CHAIRMAN. Thank you, Mrs. Wiggins.

Senator JOHNSTON. Senator Kerr, I would like to say that the League of Women Voters from South Carolina, and I think that is true as they have such organizations in other States, are doing a won-

derful piece of work keeping the people educated as to what is going on and trying to take a great deal of interest in all activities. We are certainly glad to have them here this morning.

The CHAIRMAN. I would like to share in that statement, Senator.

It happens that at every hearing this committee has held a representative of the League of Women Voters has been present and has testified. They have manifested great interest in water resource development, and they have also been guilty of some original thinking. This committee has been greatly helped by their giving us the benefit of it. So I also thank them.

Senator JOHNSTON. Mr. Chairman, I have received a letter from the League of Women Voters of Virginia, dated May 11, 1960, signed by Elizabeth T. Farwell, president.

Mr. Chairman, may this statement appear in full in the printed record?

The CHAIRMAN. Without objection it is so ordered.

(The letter follows:)

STATEMENT BY THE LEAGUE OF WOMEN VOTERS OF VIRGINIA

VIENNA, VA., *May 11, 1960.*

Hon. OLIN D. JOHNSTON,
Wade Hampton Hotel, Columbia, S.C.

DEAR SENATOR JOHNSTON: As you well know, leagues across the country have stanchly supported S. 2549, believing that the proposed Resources and Conservation Act of 1960 will provide the very much needed study and assessment of our country's natural resources in the light of the great expansion of both population and industry. The League of Women Voters of Virginia is very pleased to be able to state its firm support of S. 2549 at this Columbia, S.C., hearing of the Senate Select Committee on National Water Resources.

Local leagues in Virginia, having studied the problems in their own basins as well as those throughout the country, are seriously concerned about the need for a national policy on water resources which, hopefully, will be successful in straightening out the complicated snarl in which local, State and Federal agencies have found themselves. We sincerely believe that the combination of a national policy standard with long-range planning by both the executive and legislative branches of our Government can lead the way to solutions of what we feel to be very threatening problems.

We are well aware that the bringing in of new industry to Virginia will affect not only our northern Virginia area in the Potomac Basin, but Norfolk and Richmond in the James River Basin, and Roanoke in the Roanoke River Basin, to name a few.

To quote from our Richmond league's report on the James River: "The James River is regarded as the best oyster seedbed in the world. Virginia is not only the largest producer of market oysters in the United States, but latest indications are that the State is also the largest producer in the world (21.7 percent of world supply in 1953; 30.6 percent of the Nation). Retail value when they are processed runs to 20 to 30 million a year." There is currently a stalemate between the area business interests which are pushing for a deepened James River channel in order to boost local shipping, and the oyster industry.

Norfolk league reports that one of Norfolk's biggest water problems is to stop oil pollution violations, the detrimental effects of "illegal dumping of waste oil in the harbors by ships, as it affects the oyster and fishing industry, waterfront structures, pleasure boats and swimming at the beaches." Erosion is noted as one of the serious problems in the preservation of our shorelines.

From the Roanoke league comes the report that there are "presently developed in the Roanoke Valley, water supplies and resources capable of providing on a peak basis some 53 million gallons per day. It is now estimated, in a growth projection to the year 2000, that the water facilities of the Roanoke Valley must be capable of supplying 81.7 million gallons per day by the year 2000."

These brief examples will serve to show, we believe, our grave concern over the problems of water supply and pollution. We are very grateful for this oppor-

tunity to speak in support of S. 2549 and to reiterate our belief that better coordination of government organization and procedures for planning and administering water resources development will be truly a "giant step" forward.

We commend the Senate select committee for its painstaking conduct of public hearings throughout the country.

Yours very sincerely,

(Signed) Elizabeth T. Farwell
(Typed) Mrs. ALBERT E. FARWELL,
President,

Senator JOHNSTON. The next witness is Alan McC. Johnstone, South Carolina Water and Sewage Works Association.

STATEMENT OF ALAN McC. JOHNSTONE, SOUTH CAROLINA WATER & SEWAGE WORKS ASSOCIATION

Mr. JOHNSTONE. Mr. Chairman and members of the committee, I am Alan McC. Johnstone, manager of the Department of Public Utilities, City of Orangeburg, S.C., and am here on behalf of and representing the South Carolina Water & Sewage Works Association.

This organization was organized in 1926 and is composed of water works and sewage plant operators, superintendents, managers, municipal officials, consulting engineers, and other interested parties connected with water sanitation in South Carolina. It has 500 members from all sections of the State.

We wish to express our deep appreciation to this committee for granting us this privilege to present our views on the problem of water resources in South Carolina, because we are vitally interested in this matter.

It is our feeling and conviction that the water resources of South Carolina belong to the people of this State and should remain available for development by and for these people. We are vitally interested in water supply, both its quantity and quality, from the standpoint of human consumption.

The average annual rainfall in this State is 46 inches. This will vary from approximately 73 inches in the northwest section to approximately 42 inches in the central portion of the State. The discharge at sea level from the waters of South Carolina is estimated at approximately 50,500 cubic feet per second or 32,639 million gallons per day.

The CHAIRMAN. How much?

Mr. JOHNSTONE. 32,639 million gallons per day.

It is estimated that the people of this State use 239 million gallons per day for domestic purposes at the present time, and that industrial uses of water require 1,200 million gallons per day. As a matter of information one large industry alone uses 1 billion gallons per day.

The CHAIRMAN. Would you tell us what industry that is?

Mr. JOHNSTONE. Sir?

The CHAIRMAN. Would you tell us what industry that is?

Mr. JOHNSTONE. I don't know whether I could or not, sir.

The CHAIRMAN. What did you say was the total industrial use of the State?

Mr. JOHNSTONE. Around 1,200 million gallons, we estimate.

The CHAIRMAN. And one industry alone uses——

Mr. JOHNSTONE. As I understand, one of them uses around 1,000, sir.

The CHAIRMAN. That would be five-sixths of the total used by all the industries in the State?

Mr. JOHNSTONE. It would be ten-twelfths of it; yes, sir, five-sixths.

The CHAIRMAN. That is quite interesting.

Mr. JOHNSTONE. Yes. Those are our estimates of our association.

Hydroelectric and steam electric plants use 31,440 million gallons per day. All of this adds up to a grand total of 32,879 million gallons per day or approximately 50,870 cubic feet per second being used by the people of South Carolina at the present time. These figures do not include any allowance for agricultural, irrigational, or recreational uses.

With our present population estimated at 2,391,000, this means that the prorated per capita use of water for the people of South Carolina is 13,750 gallons per day. With an estimated population by 1980 of 3½ million, 48,125 million gallons per day will be required with no consideration being given to increased uses per person.

At present, streams are being used to the point where practically all water is needed for dilution purposes as far as waste disposal is concerned, both industrial and domestic. Even at present this is an acute problem at periods of low stream flow.

Consequently, a great deal of consideration needs to be given to the development and adequate means of waste disposal. Present usage requires water to be used over and over again, and by 1980 this reuse factor will of necessity have to be increased several times in order to have 48,125 million gallons per day available.

Still another problem is that this water usage is not evenly distributed over the State, so the water in the Piedmont area is reused more than that in the coastal plain.

Based on these facts the following recommendations are respectfully submitted:

1. That the waters of this State remain available to the satisfaction of requirements for the orderly economic development of South Carolina.

2. That all waters of the State be controlled by an appropriate State agency.

3. That research be provided and expanded in the following areas:

(*a*) Methods of waste treatment and conditioning of water for reuse.

(*b*) Ground water resources.

(*c*) Gathering information and facts on questions proposed by this committee as to costs.

(*d*) Basic information on all aspects of water resources.

We thank you again, Mr. Chairman and members of this committee, for this opportunity to present these views on this most vital subject.

The CHAIRMAN. Thank you, Mr. Johnstone.

Mr. JOHNSTONE. Thank you.

Senator JOHNSTON. I notice that Mr. Carlisle Crump has come in so he is the next witness.

STATEMENT OF T. CARLISLE CRUMP, ADMINISTRATIVE ASSISTANT, SOUTH CAROLINA STATE PORTS AUTHORITY

Mr. CRUMP. Mr. Chairman, I have no specific recommendations or testimony to produce.

The State ports authority is extremely interested in the program that you are pursuing and while we are familiar with some of the testimony which may be adduced here during your hearing, we have nothing of a specific nature to suggest to you.

As the State agency authorized to develop the ports of the State, and I might interject that we have been successful to a certain degree, we are naturally interested in the development of our navigable streams, particularly so the study that has been underway for the past year by the Santee-Congaree River Water Commission appointed by our State legislature last year.

Beyond that, sir, I do not believe we have anything of a definite or specific nature which we want to introduce.

Thank you very much.

The CHAIRMAN. Thank you, sir.

Senator JOHNSTON. Thank you.

Mr. E. H. Agnew?

(No response.)

Senator JOHNSTON. William T. Callahan.

STATEMENT OF WILLIAM T. CALLAHAN, TRAFFIC MANAGER, CHARLESTON COUNTY RATE TRANSPORTATION SERVICE

Mr. CALLAHAN. Mr. Chairman, and gentlemen of the committee, I want to thank you for the opportunity of appearing before you, and I realize from press dispatches that you are going to Carolina low country, and I know you will thoroughly enjoy yourselves.

Thank you, sir.

The CHAIRMAN. To what do you refer when you say the Carolina low country?

Mr. CALLAHAN. Low country around Charleston, what we in South Carolina call the low country.

The CHAIRMAN. Is that the name they give themselves, or is it bestowed upon them by others?

Mr. CALLAHAN. It is from the olden days, Mr. Chairman.

The CHAIRMAN. All right.

Go right ahead, Mr. Callahan.

Mr. CALLAHAN. Mr. Chairman, and gentlemen of the committee, I am going to handle this thing from strictly a transportation point. I am not an engineer, and I don't know the engineering qualities of it, and I am not a water pollution man, but I am going to try to inject a new phase into this situation and I will read this statement.

Mr. Chairman and gentlemen of the committee, I am William T. Callahan, traffic manager of the Charleston County Rate Transportation Service in Charleston, S.C. My experience is as follows:

I have been connected in transportation for over 40 years. First, I served about 5 years in the billing and shipping department of the Virginia-Carolina Chemical Co. I served as freight rate clerk for a period of 10 years at the Charleston agency of the Atlantic Coast Line

Railroad. For a period of about 8 years I served on the port utilities commission as assistant to Mr. Runey, the general manager. During this time to get practical experience I served as a switchman, yard conductor, and night yardmaster for about 6 years. Prior to my appointment as manager of the bureau in 1951 I served for a period of some 12 years as executive assistant of the bureau. Since 1939 I have been connected with my department, first as assistant manager and for the past 9 years as manager.

For the past 10 or 15 years in every trade journal and transportation journal received in my department, I have noted that where river transportation and abundant supply of raw water was concerned, industry has followed the example of past history and moved into this area.

In my general opinion, in South Carolina we are at the present time 30 to 40 years behind schedule with our sister states of Georgia and North Carolina. The Savannah River has been developed from Savannah, Ga. to Augusta, Ga., a distance of 214 miles, with a 90-foot channel and a depth of 9 feet, making Augusta a port city. In North Carolina the Cape Fear River has been channeled as far as Fayetteville, making Fayetteville a port city. In Alabama, the port of Birmingham has been made possible by development of the Warrior and Coosa Rivers. In the State of Florida, the St. Johns River is under project now from Jacksonville to Sanford and probably a barge canal to the gulf.

My ambition is the development of the South Edisto River, using the Ashley River, with a canal to connect with the South Edisto near Givhans Ferry, using the South Edisto to Guingnards Landing in Aiken County or the flat country between Guingnards Landing and Williston with a canal connecting with the Savannah River to reach Augusta by Savannah River or North Augusta on the South Carolina side. In Ulrich Phillips' book "Transportation in the Southeast" from 1790 until after the Civil War there was a 3-foot channel on the South Edisto River to Guingnards Landing. That is about 12 miles from Aiken, S.C. This was known to be the swiftest running river in the State of South Carolina.

Logging operations before and after the Civil War clogged up the main stream with considerable sandbars and the outlet to the sea was formed by sometimes as high as four and five branches. If the proper channel and drainage were put into the original or shortest line possible channel with the diversion of waters from the Savannah River to supplement the drainage already going into this stream, we would have sufficient water.

Therefore, I am highly in favor of the projects of Carters Island and Goat Island on the Savannah River between Hartwell Dam and Clark's Hill, as we need to impound and conserve every gallon of water available.

In this connection, my information from press dispatches in the past few days is that the State of Arizona won from the State of California a long-disputed claim that Arizona had made to secure some 2,800 million acreage feet of water for agricultural and industrial purposes. In connection with this development, I understand that North Edisto River from Orangeburg to Embree, where it connects with the South Edisto, during WPA days and Harry Hopkins' time, it was fairly cleared of all logs. This could possibly make

Orangeburg a port city. The alternate route for the South Edisto River would be its natural channel to connect with the Intracoastal Waterway in the vicinity of Edisto Island. The distance from Augusta to Charleston via Southern Railroad is 140 miles. The Edisto River practically parallels this line with a cutoff at Givhans Ferry to the Ashley River. The distance by river Augusta, Ga., on the Savannah to Savannah, Ga., is 214 miles.

My information from the U.S. Engineers Office in Atlanta is that their straightening program has been completed to such an extent that if it were straightened any further it would be a complete mill race. My information from people who are interested in river development around Augusta, the chamber of commerce, et cetera, have stated to me that they do not care what river the traffic moves on as long as they get the benefit in the freight rates. I think they realize the State of Georgia through its port authority and their program of developing the Chattahoochee River at Columbus and Bainbridge, also a talking project of developing the Okmulgee, Altamaha, and St. Mary's River to Brunswick and Jacksonville, Fla., from Macon, Ga., my frank opinion is this: that in my experience of attending hearings of motor carriers all over the southeast of motor carriers and transportation of freight over the highways, once a shipment is loaded on a vehicle, a distance up to 150 miles does not make any material difference considering the extra handling charges. It is simply on and off loading proposition. The textile business from Piedmont, S.C., and North Carolina, now enjoyed by the State port at Charleston, is jeopardized by a truck-barge haul via August to Savannah and all other commodities of like manner.

In north Georgia, near Gainesville, the Buford Dam is located. This dam controls the flow of the Chattahoochee River all the way to the gulf. They have Walter George Dam near Columbus, Ga.—83 feet high, with a lock 100 feet wide, 450 feet long, with an 83-foot lift.

The Jim Woodward Dam near Bainbridge is 53 feet high, with a lock 90 feet wide, 450 feet long, with a lift of 53 feet.

The type of barges used in the operation are either two barges or push-barges with a draft of 8 feet, some 90 feet to 120 feet long, with a width of 20 feet to 25 feet. This seems to be standard size for locks and equipment and barges, I would say. The project will be completed to Columbus, Ga., and Phenix City, Ala., in about 2 years.

There has been a talking project in the State of Georgia since 1954 of connecting all the smaller rivers in northern Georgia and canals to connect with the Tennessee River at Gadsden, Ala., flowing by Rome, Gainesville, and connecting with the Savannah River between Clark's Hill Dam and Hartwell Dam, also to connect with this project a short distance from Buford Dam to the Chattahoochee River to put Atlanta as a port city and if I know Atlanta people, they seem to have a knack of accomplishing what they go after. Every man puts his shoulder to the wheel. With this teamwork they have unlimited success in every effort. Most of the trade and manufacturing journals today predict in the year 2000 Atlanta will be the largest city in the United States.

I realize any river navigation project is a long-haul proposition. It takes a long time—more than 20 years—to get a development in a

project completed; therefore, I think some steps should be taken now to get the South Edisto River in South Carolina and lend every assistance possible to the trans-Georgia project for Charleston's protection. Both the trans-Georgia and Edisto projects are in the talking stage. They have already picked 10 damsites along the route—that is how far this had advanced. At Buford, Ga., near Gainesville, they have a dam in operation that will furnish enough water to run through the Chattahoochee to furnish enough water to put Atlanta and Columbus as port cities. This will place Atlanta on two outlets, one to the gulf and one to Savannah. This will give a physical connection to Savannah and Atlanta, with the Mississippi, Missouri, Illinois, Arkansas, Red River in northwest Louisiana, the Tennessee River from Knoxville and Chattanooga to Cairo, the Cumberland River and the Ohio River from Pittsburgh, through Charleston, W. Va., Cincinnati, Ohio, Louisville, Ky., Evansville, Ind., to Cairo. The Illinois and the ship canal run from Chicago, through Joliet, Peoria, to St. Louis, Mo. The Mississippi runs from St. Louis on up to Minneapolis-St. Paul, through Dubuque, Davenport, Burlington, and Fort Madison. The Missouri River runs from Sioux City, Council Bluffs, Omaha, St. Joseph, Kansas City, Jefferson City, to St. Louis on the Mississippi and on south to New Orleans. The trans-Georgia waterway will place Savannah in direct connection with the whole Missippi Valley and all its tributaries.

From Sioux City; Minneapolis; St. Paul; Chicago; Pittsburgh; Nashville on the Cumberland; Knoxville; Chattanooga; Guntersville; Cairo; Evansville; Paducah; Cincinnatti; Portsmouth, Ohio; Sheffield, Ala.; Louisville, Ky.; Frankfort, Ky.; Louisville, Ky.; Morgantown, W. Va.; Marietta, Ohio; Parkersburg, W. Va.; Huntington, W. Va.; St. Louis and East St. Louis; Memphis, Tenn.; Helena, Ark.; Greenville, Miss.; Vicksburg; Natchez, Miss.; Baton Rouge, La. (Standard Oil tankers go to Baton Rouge now); New Orleans; Mobile; Gulfport; Pensacola; Port St. Joe; Tampa; Port Arthur; Lake Charles, La.; Galveston; Texas City; Corpus Christi; and Brownsville.

The physical connection with the Savannah River on the Carolina side and the Trans-Georgia Waterway with a connection at Gadsden with the Tennessee River will open up the above territory I just mentioned.

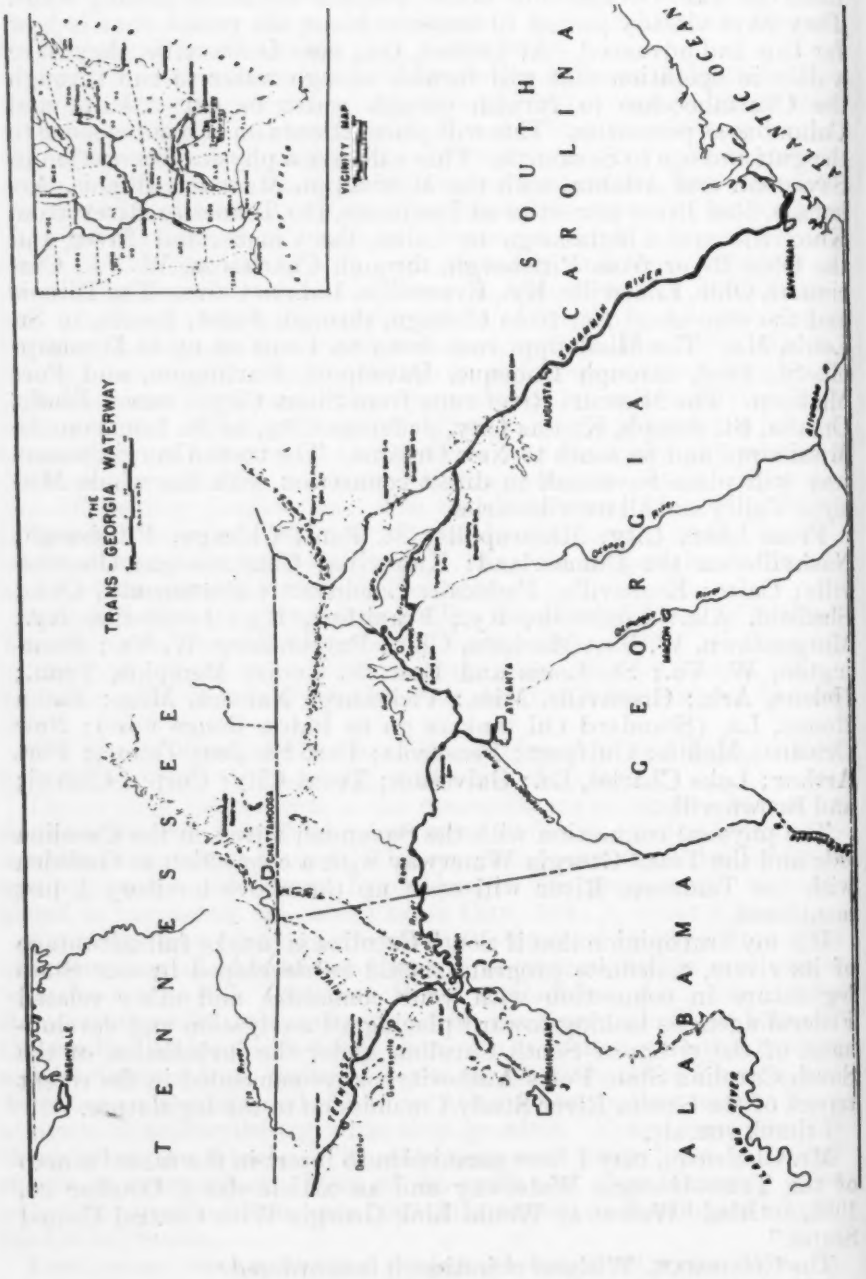
It is my firm opinion that if South Carolina is to take full advantage of its rivers, a definite program should be developed by our State legislature in connection with your committee and other related Federal agencies looking toward placing all navigation and development of the rivers of South Carolina under the jurisdiction of the South Carolina State Ports Authority, as recommended in the recent report of the Santee River Study Commission to the legislature.

I thank you, sir.

Mr. Chairman, may I have permission to insert in the record a map of the Trans-Georgia Waterway and an article dated October 26, 1954, entitled "Waterway Would Link Georgia With Central United States."

The CHAIRMAN. Without objection, it is so ordered.

(The information follows:)


VICINITY MAP
THE TRANS-GEORGIA WATERWAY
ATLANTIC OCEAN
SOUTH CAROLINA
GEORGIA
TENNESSEE
ALABAMA
SAVANNAH RIVER
AUGUSTA
SAVANNAH
ATLANTA
CHATTANOOGA
NASHVILLE
BIRMINGHAM
MACON
COLUMBUS
TENNESSEE RIVER

WATERWAY WOULD LINK GEORGIA WITH CENTRAL UNITED STATES

A Trans-Georgia Waterway directly linking the Central United States to Georgia's thriving seaport at Savannah was proposed today by Ivan Allen, Jr., chairman of the Industrial Development Committee of the Georgia State Chamber of Commerce.

In a speech before the Rotary Club of Augusta, Allen asserted that this direct water route of less than 600 miles from Guntersville, Ala., to Savannah is entirely possible, entirely practical, and in fact virtually essential if the States of Alabama, Tennessee, Georgia, and South Carolina are to gain the economic advantages enjoyed by other progressive States.

Allen said that the waterway would open the heart of the entire eastern seaboard to industrial growth and to commercial prosperity which would be possible by no other means. He added that its military advantages, alone, would justify the completion of this project. Moreover the value of this waterway as a flood control project, and for the irrigation of farmland, and for generating electric power is of major importance. The recreational and health value of fishing and boating activity would be still another plus value in completion of the waterway, he added.

PRESENTS FIGURES

He presented figures from a survey of the 4 watersheds traversed from the Tennessee River to Savannah, indicating that a slackwater channel of 9 to 12 feet and utilizing only 40 locks could be made navigable at reasonable cost.

The potential tributary area from which traffic would develop, he estimated, would embrace the entire Central United States. Any considered traffic would include a careful study of the ultimate destination of the commodities moved downstream through Cairo, Ill.

He estimated that a probable annual tonnage of 20 million tons would move over the waterway in average 3,000-ton tows, using 20 lockages per day, averaging 45 minutes per lockage.

Allen emphasized that the Trans-Georgia Waterway does not now exist for the simple reason that construction methods for building it were not possible 15 or 20 years ago. But now, he pointed out, the machinery and the engineering knowledge for changing terrain, moving dirt, dredging, and pouring concrete make it possible and practical to build this water route.

"In fact," he said, it is actually our duty now to consider the building of this waterway for our farsighted Senator and Congressmen from the Southeastern States recognized the need for it when they worked to make possible such magnificent developments as Clark Hill, Lake Buford, Lake Allatoona, TVA, and all the other navigation, flood control, and power projects. On the TVA waters immense barges are now carrying millions of tons of cargo. The opportunity is before us to provide a shortcut for cargo which is now carried many hundreds of unnecessary miles down the Mississippi and around the peninsula of Florida. This cargo should and must come directly through Georgia—from Guntersville to the warm water port at Savannah.

Senator JOHNSTON. Mr. Callahan, you have given us some valuable information and pinpointed a great deal of it.

Mr. CALLAHAN. Mr. Senator, I might state this: if we could get this thing started, from Atlanta right on through that whole territory, a tremendous amount of freight could be moved over it and just like on a rail haul, it is right in our backyard. We can compete with New Orleans, Mobile, and Savannah both and give Atlanta three outlets to the sea. We can beat the haul on the Edisto River from Augusta to Charleston over Savannah by 75 miles. It takes a barge about 100 miles for 12 hours to travel and that would be about one-third of the time. Upstream is just about double the pace.

I thank all of you gentlemen.

Senator JOHNSTON. Thank you.

The next witness is Mr. Ernest B. Rogers, Jr., Clemson.

STATEMENT OF ERNEST B. ROGERS, JR., CLEMSON, S.C., ON BEHALF OF THE ABBEVILLE PLANNING AND DEVELOPMENT BOARD OF ABBEVILLE, S.C., AND THE McCORMICK CHAMBER OF COMMERCE, McCORMICK, S.C.

Mr. ROGERS. Mr. Chairman, and other distinguished committee members, I am appearing here on behalf of the McCormick Chamber of Commerce, McCormick, S.C., and the Abbeville County Development Board in Abbeville, S.C., in the capacity of a registered engineer licensed under the laws of South Carolina.

May I assume your permission to preface my remarks with one brief statement?

I wish to say, not necessarily for the record but rather for the benefit of my good friends in McCormick County, that I am not in any way whatsoever, either biologically or politically, akin to one William P. Rogers.

The CHAIRMAN. Now that is not a matter within the jurisdiction of this committee, necessarily. However, it just happens that the chairman has contemplated the possibility of some biological kinship between all of God's children. I would hope the burden would not be any greater on you than it is on the rest of us.

Mr. ROGERS. Let me first express my sincere appreciation for being extended the honor of appearing before your committee.

I shall, in keeping with the wishes of your committee, limit my oral testimony to a brief abstract of a complete statement which is being filed for the record.

It is not my purpose in speaking here to deal invectively with any branch of the Federal Government. I do feel, however, that I would be derelict in my responsibilities as a citizen and to the organizations I represent if I failed to call attention to certain facts which are matters of public record. These facts, by their very nature, reflect on the attitudes and responsibilities of certain Government agencies.

A current proposal, to build two projects on the Savannah River is based on benefit figures which are fictitiously created on unrealistic interest rates and represents an utter disregard for the principles of fiscal responsibility.

Such is the Army Engineers' basis for claims of economic feasibility. This, I believe, is a travesty on the American taxpayer. Certainly, for the taxpayers' protection, any claim of economic feasibility should be based on realistic data and sound accounting procedures.

The CHAIRMAN. May I get orientated, Mr. Rogers?

Mr. ROGERS. Yes, sir.

The CHAIRMAN. You are addressing yourself to what particular area? Is it the Savannah River?

Mr. ROGERS. No, sir. My statement concerns water resources in general for the whole State but I simply use this as background information and it is very brief.

The CHAIRMAN. I understand. I thought you said proposal to build two projects on the Savannah River.

Mr. ROGERS. I simply use that as background information. I will get away from that.

The CHAIRMAN. I was just trying to orientate myself on the map.

Mr. ROGERS. Right. These projects are between the currently operating Clark Hill Authority and the now under construction Hartwell Reservoir.

The CHAIRMAN. Where is the Hartwell Reservoir?

Mr. ROGERS. The Hartwell Reservoir is just below Anderson County on the Savannah River, sir.

The CHAIRMAN. Is that below Augusta?

Mr. ROGERS. No, sir. That is north of Augusta.

The CHAIRMAN. Then Hartwell would be above the Clark Hill Reservoir?

Mr. ROGERS. Yes, sir, that is correct.

The CHAIRMAN. Yes. And the two projects you referred to would be located between the reservoir being constructed at Hartwell and the one in operation in Clark Hill?

Mr. ROGERS. That is correct, sir.

The CHAIRMAN. Very good.

Mr. ROGERS. I can document this information, but for the sake of brevity I decided to leave out this documentation.

The CHAIRMAN. I was trying to get myself orientated so I would have the benefit of some knowledge of what you are talking about.

Mr. ROGERS. Right. I am glad to give you that information, sir.

The CHAIRMAN. Fine.

Mr. ROGERS. Historic precedents, based on similar projects throughout the country, would seem to indicate gross inability on the part of Federal agencies to accurately estimate construction costs. Of some 57 projects on which I have studied data, not one had a completion cost anywhere near the preliminary estimate. Economic soundness and feasibility continue to be claimed, by Federal agencies, regardless of final costs. I suppose, in keeping with present-day politically inspired cliches, we might refer to it as "bureaula."

The rate of population increase in the Southeast, as well as certain other sections, is very high. Many young people, born, reared and educated in this area, are finding it necessary to secure satisfactory employment elsewhere, in many instances outside of the South. Such migration detrimentally affects the economy of the area in many ways. The effects caused by this migration can best be avoided by having a substantial and continuous growth of employment opportunities within the area concerned.

From the viewpoint of competitive industrial and agricultural development, it is dangerous and unwise for the Federal Government to acquire control of the water resources of a region. Development of an area requires, as a general rule, that industrial plants and farms have access to water for use in production and for waste disposal as well as for domestic use. Such development also requires that the water be made available in generous amounts with a minimum of legal and administrative impediments, and that increased amounts be readily available in the future to provide for plant expansion and technological changes. No State, county or municipality can guarantee industrial and agricultural water supplies if the water involved is impounded in federally owned reservoirs subject to Federal regulation and control. The withdrawal of water from such impoundments and the dumping of waste materials into them are governed by rules arbi-

trarily imposed by the responsible Federal agency or by the National Congress.

This means that industrial and agricultural potential and the employment opportunity of a community would likely be determined by people who have no personal interest whatsoever in the economic welfare of the people of that community, or worse yet, such determinations could be made by people who are actually antagonistic toward the economic growth of the area concerned.

Specific needs for water resource control and development do not necessarily transcend the various geographic, political, and social boundaries within the United States. Water policies which may be desirable for Nevada, where 87 percent of the State is federally owned, may not necessarily be applicable to the needs of South Carolina. Population density, growth and industrial potential are certainly very real criteria for judging water policy needs. Such criteria are very different in different sections of the country. This serves to emphasize the philosophy that matters pertaining to water policy should be left to, and where applicable should be returned to, State and local control.

Senator SCHOEPPEL. I would like to ask you a question.

Mr. ROGERS. Yes, sir.

Senator SCHOPPPEL. Do you believe in the theory of the interstate water compact?

Mr. ROGERS. Only——

Senator SCHOEPPEL. Here you have a boundary river. Obviously, your industry on your side of the river could not pollute that stream unduly but what if some detrimental damage would flow down from above? How would you reach that; through interstate compacts?

Mr. ROGERS. I believe that is a situation that should be solved between the two States concerned.

Senator SCHOEPPEL. That would have to be done by some kind of compact, would it not?

Mr. ROGERS. Right, sir; between the two States. That is correct.

We have included in our testimony tabulated data, on several industrial processes, which show the value of water as an industrial resource. Careful study of these figures would seem to indicate the profligacy involved in bartering one of our most valuable resources to the Federal Government for a handout in the form of an inefficient powerplant and a fishing hole of doubtful need and capability.

We are opposed to the "big dam" technique of water resource development for the following reasons.

(1) Upstream conservation measures result in greater net conservation and more strategic dispersal of water supplies.

(2) Big dams provide virtually no means for raising the general water table since insoak area is relatively small compared with upstream and watershedwide practices.

(3) Big dams on main streams and tributaries inundate large acreages of our best farmland.

(4) In low-gradient streams and runoff areas, great damage accrues to farmlands and tributary streams due to backwater sedimentation.

(5) The multipurpose theory of construction for water conservation and hydroelectric power production is based on two purposes which are inherently antagonistic.

(6) Big-dam development acts as a deterrent to industrial and agricultural growth because of the right to use impounded waters being severely restricted if not indeed prohibited.

(7) Many benefits and claims of economic feasibility for big-reservoir projects are based on unrealistic and fictitiously created data. Claims made in original proposals never seem to develop after operation begins.

(8) Water resources should be developed for maximum production and employment. Such is not a characteristic feature of federally built big-reservoir impoundments.

(9) By their very nature, Federal construction of large reservoir projects is characterized by extravagant spending. Completion costs have run as high as 580 percent of original estimate.

(10) Much of the support for construction of federally owned water impounding facilities is based on collectivist and socialistic theories.

Senator SCHOEPPEL. I would like to ask you another question at this point—Mr. Chairman, if you do not mind?

Mr. ROGERS. Yes, sir.

Senator SCHOEPPEL. Many areas of the country may not be blessed, geographically speaking, such as your area here, with your streamflows. Do you agree with me that in many sections of the country streams are not always uniform in their flow? They are not even uniform in their flow in your area here, I am sure of that.

Mr. ROGERS. That is true. That is correct, sir.

Senator SCHOEPPEL. Do you not think there is some responsibility where large dams are constructed for flood control purposes that they are necessary?

Mr. ROGERS. I believe that I covered that in my statement, which is filed for the record, that where this is proven, that it should be proven, that that is the best way to do it. Now, I agree that there may be cases where big dams are the best solution. I am not entirely cognizant of the whole situation in the West. I have read quite a bit on the Bureau of Reclamation and on certain other agencies in the country, but I cannot say that I am as familiar with the situation in other parts of the country as I am in the Southeast.

Senator SCHOEPPEL. It might interest you to know that in a number of areas that by reason of these large installations impounding floodwaters and saving the havoc and damage caused by flooding, scores of downstream cities have been helped tremendously by the stabilized flows and the properly treated sewage going into these streams. To that extent, certainly you would agree that is a beneficial result to the people of the country, would you not?

Mr. ROGERS. If it can be proven, then I will support it, just as much as I oppose this; yes, sir.

Senator SCHOEPPEL. Thank you. I just wanted to know whether you are completely restrictive or whether you did feel that there was some justification for some of these projects.

The CHAIRMAN. I would like to ask you a question or two, Mr. Rogers, at this point, before you get on to another subject.

Mr. ROGERS. Yes, sir.

The CHAIRMAN. You say that you believe that water conservation should be limited to watershed treatment other than reservoirs.

Mr. ROGERS. Where it is the best method. Now, it was my understanding from the instructions that I got from Senator Johnston I was necessarily supposed to make this brief, so maybe I had better qualify that from the complete statement.

The CHAIRMAN. I am just trying to get some information from you. If you prefer not to have questions, we will avoid them.

Mr. ROGERS. No, sir. I am perfectly willing to answer them but I wanted to point out that unless it can be conclusively shown that the Federal construction of these big impoundments is the best method—and I don't believe where a Federal agency, in order to prove a benefit-cost ratio greater than 1 to 1, fictitiously creates figures of nearly $3 million per year in excess of the anticipated income to justify the project. I don't agree with it.

The CHAIRMAN. I know of no one connected with this committee, or the Congress for that matter, that supports fictitious figures. I am just addressing myself to some statements that you made.

Mr. ROGERS. Yes.

The CHAIRMAN. For instance, on page 3, near the lower half of the table, the paragraph numbered 1, upstream conservation measures such as reforestation.

Mr. ROGERS. Yes, that is different; yes.

The CHAIRMAN (reading):

Sound soil and water conservation practices in small detention reservoirs will result in greater net conservation and more strategic dispersal of water supplies.

How many such projects do you have in South Carolina?

Mr. ROGERS. These upstream water conservation?

The CHAIRMAN. Whatever it is you are talking about there.

Mr. ROGERS. I can't answer that question, sir. But I am trying to make my testimony in such a way that your actions may to some extent be based on this technical fact.

The CHAIRMAN. I am just addressing myself to the application of your statement. Could you give me an example of a program you are talking about?

Mr. ROGERS. I use reforestation.

The CHAIRMAN. I mean an area in which such a program is in operation.

Mr. ROGERS. Those, I am not prepared to give that.

The CHAIRMAN. Do you know of any?

Mr. ROGERS. No, sir. I am basing that on the fact that we have underground a tremendous potential for storage of water.

The CHAIRMAN. Are your forests underground?

Mr. ROGERS. No, sir; but the forests intercept the rainfall.

The CHAIRMAN. I know they do.

Mr. ROGERS. And cause it to go underground.

The CHAIRMAN. I understand they do, and I am quite favorable to reforestation and sound soil and water conservation practices and small detention reservoirs. I am quite familiar with such programs and very much in favor of them. And the reason I am asking you if you are familiar with these reservoirs is that I wanted to know if it had succeeded, in the periods of rainfall such as we have had described to us here of up to 75 inches a year, in holding the rainfall.

Mr. ROGERS. Have they succeeded?

The CHAIRMAN. Yes.

Mr. ROGERS. Yes, sir; I would say they succeeded where they have been built. We have numerous ponds and lakes the States built across gullies.

The CHAIRMAN. We have quite a few of them in Oklahoma; on the basis of our area, more than any other State in the Union. Our average rainfall is about 30 inches instead of 46, as has been described here. Although we have more than any other State in the Union on the basis of our area, we have none which have succeeded in holding all of the rainfall that occurs. I just wondered if you did here, where you have 50 to 75 percent more rainfall, because if you do have, I want to take the time and go see it.

Mr. ROGERS. I will say this. We don't have enough of them.

The CHAIRMAN. Well, but if you have any, you know where they are, you tell me.

Mr. ROGERS. Yes, sir, they are throughout the State. I said I cannot give you any specific examples and I mean by that I cannot give you any specific examples of data which has been collected to indicate how much water in cubic feet they have been responsible for impounding.

The CHAIRMAN. But you are prepared to back up your statement that where they are developed they hold all of the water that falls and eliminate the danger of flooding below occurring by reason of the overflow of the excess of water which they cannot hold?

Mr. ROGERS. I think that enough of them would do a very good job. I am not going to completely condemn all flood control, but the only way I know to illustrate a point——

The CHAIRMAN. You do not believe the so-called big dams have any place in flood control?

Mr. ROGERS. Senator, the only way I know to talk about this is about specific projects.

The CHAIRMAN. You made the statement "We are opposed to the big-dam technique of water resource development." Are you referring there to a specific project or to a general proposition?

Mr. ROGERS. I am referring to it in general as they are being built in the Southeast. I am having to limit myself to the Southeast in general rather than nationwide, but it is simply——

The CHAIRMAN. Therefore, I believe you mean regionally.

Mr. ROGERS. It is hard for me to think otherwise.

The CHAIRMAN. But then what you are now telling me is that your convictions in this matter are limited to this region?

Mr. ROGERS. That is true, yes, sir.

The CHAIRMAN. So that your opposition to big dams is insofar as they relate to this region?

Mr. ROGERS. Speaking for the people I represent, yes, sir. Speaking personally, I have other feelings, but I am representing two organizations here and I would rather not presume anything.

The CHAIRMAN. Fine. All right.

Mr. ROGERS. Maybe the next paragraph clears that up to some extent. I do not profess to know what is best for every area of the country. I do believe, however, for the South in general and South Carolina in particular, we will be much better off with private develop-

ment of our water resources under such regulatory statutes as our State and local goverments find necessary to impose.

The CHAIRMAN. Do you think your State could regulate the flowage of the water in the Savannah River?

Mr. ROGERS. They could regulate the flowage that falls on South Carolina and which flows into the Savannah River, which is a major part of it.

The CHAIRMAN. Does more water flow into the Savannah from South Carolina than from Georgia?

Mr. ROGERS. That I do not know, sir.

The CHAIRMAN. Can you regulate flowage of the water in the river from your State without also regulating the water which flows into the river from Georgia?

Mr. ROGERS. We can regulate that portion of it which flows from our State, yes, sir.

The CHAIRMAN. After it reaches the river?

Mr. ROGERS. No, sir.

The CHAIRMAN. All right.

Mr. ROGERS. But let me clear that, too, for the record. To quote from House Document 657, 78th Congress, 2d session, dated June 9, 1944—this is before the construction of Clark Hill, before the construction of Hartwell. You have mentioned flood control and how I feel about flood control. This is a quotation from the record.

The CHAIRMAN. No, I did not mention it. You mentioned it. I was asking you about it. I did not mention it.

Mr. ROGERS. The point I am trying to make is that these projects currently proposed based on my study of them, the ones that I have studied are not built for flood control.

The CHAIRMAN. You are on another subject now. I was just questioning you with reference to your statement there on page 4, which you have just read, that South Carolina would be much better off with private development of your water resources. And I have no quarrel with that at all, none whatever. I just wanted to ask you about the application of your statement to the waters of the stream which constitutes a State boundary and in which I would presume that both States have an interest. You said that the regulatory statutes your State and local government find necessary to impose would be sufficient. I was only questioning you about the application of that principle to the waters of an interstate stream. I was not asking you about 1944.

Mr. ROGERS. You said I was the one who mentioned flood control. I am trying to find out where I mentioned it. If I did, I am sorry, sir. I did not mean to. It was inadvertently done. I was talking about conservation and more strategic dispersal for the economic development of the State. The Army Engineers themselves have claimed no flood control problem and that was the documented statement from the House record which I was going to read into the record.

The CHAIRMAN. What do you understand to be the purposes of upstream conservation and detention reservoirs if it is unrelated to flood control?

Mr. ROGERS. Conservation of water for industrial use and domestic use, sir.

The CHAIRMAN. Aside from any relation to flood control?

Mr. ROGERS. Right, sir. I have no reason to believe that we have a flood control problem in this section. I am not talking about the United States in general now.

The CHAIRMAN. Yes.

Mr. ROGERS. But I am talking about this section and the organizations that I represent, bordering on the Savannah River, so necessarily I have got to think for them and I am trying to keep——

The CHAIRMAN. You contemplate the possibility that what is, I presume, referred to as big dams, have a relation to flood control in some areas of the country.

Mr. ROGERS. In some areas of the country, not in the area which I am representing, no, sir.

The CHAIRMAN. Have no relation to it?

Mr. ROGERS. Have no relation whatsoever.

The CHAIRMAN. To flood control?

Mr. ROGERS. According to the Army Engineers.

The CHAIRMAN. I thought you had repudiated the Army Engineers. Do you now rely on them?

Mr. ROGERS. I do not repudiate that statement.

The CHAIRMAN. I would be glad if it were possible that your statement be based on your own convictions. However, if they are absent and you want to choose some of the Army Engineers and support them with your approval and others throw them aside by your decision, is that it?

Mr. ROGERS. No, sir, I do not want to do that, but when they are the only organization that I know of who has made a flood control study of the Savannah River—by their testimony in the House document.

The CHAIRMAN. I had presumed you had, in view of the fact you said there was no problem there.

Mr. ROGERS. I can only accept their technical data and make my own analysis and I would say that my analysis agrees with theirs, that there is no flood control problem above the city of Augusta. According to their own testimony, the levee which is around the city of Augusta adequately protects it against a 2,000-year-frequency flood and I do not see how a 50-year-life dam is going to contribute much to flood control in a case like that.

The CHAIRMAN. That is the flood control problem in Augusta?

Mr. ROGERS. I beg your pardon, sir?

The CHAIRMAN. That is with reference to the flood control problem in Augusta?

Mr. ROGERS. With reference to the flood control problem throughout the Savannah River basin.

The CHAIRMAN. I thought you said there was none.

Mr. ROGERS. I said there was no flood control problem.

The CHAIRMAN. Yet you say that the flood control levees around Augusta protect it from the floods?

Mr. ROGERS. That alleviates the problem in Augusta and they say that there is none and I agree with them as a matter of technical analysis of what technical data is available. I agree with them that there is no flood control problem above Augusta.

The CHAIRMAN. And none below it?

Mr. ROGERS. And none below it.

The CHAIRMAN. But there was one at Augusta and that has been alleviated?

Mr. ROGERS. By the levee, that is right, sir.

The CHAIRMAN. I see. Well, that is nice. Go ahead.

Mr. ROGERS. I think your committee and the Congress could exert tremendous influence for the good of our country by selling the people on the idea that our valuable natural resources, including water, soil and people must, most effectively and frugally, be developed and protected at the local level, developed and protected in keeping with problems and responsibilities which are quite different in different sections of the country.

I think because this thing is dragged out here a little bit, the last statement is more or less personal, it a personal view and I will omit that. It is filed for the record.

The CHAIRMAN. Very good, sir. The statement will be included in the record.

(The statement follows:)

WATER RESOURCE DEVELOPMENT IN THE SOUTHEAST

STATEMENT BY THE ABBEVILLE COUNTY DEVELOPMENT BOARD, ABBEVILLE, S.C., AND THE MCCORMICK CHAMBER OF COMMERCE, MCCORMICK, S.C., PRESENTED BY ERNEST B. ROGERS, JR., P.E., CLEMSON, S.C.

It is not my purpose, in speaking here, to deal invectively with any branch of the Federal Government. I do feel, however, that I would be derelict in my responsibilities as a citizen and to the organizations I represent if I failed to call attention to certain facts which are matters of public record. These facts, by their very nature, reflect on the attitudes and responsibilities of certain Government agencies.

Projects are currently being proposed by an agency of the Federal Government on the pretense of utilizing water resources for electric power production. The proposal to build two projects on the Savannah River is based on benefit figures which are fictitiously created and unrealistic interest rates and represents an utter disregard for principles of fiscal responsibility. The Army Engineers, in this recent proposal, claim benefits of nearly $3 million per year in excess of anticipated annual revenues.[1] In calculating annular operating costs, an interest rate of 2.50 percent is used when it is well known that the current rate of interest on U.S. Treasury bonds is well above 4 percent[2] for virtually all issues and, according to the press, has been as high as 4.50 percent on recent borrowings. Such is the Engineers' basis for claims of economic feasibility. This, I believe, is a travesty on the American taxpayer. Certainly, for the taxpayer's protection, any claim of economic feasibility should be based on realistic data and sound accounting procedures.

Historical precedence, based on similar projects throughout the country, would seem to indicate gross inability on the part of Federal agencies to accurately estimate construction costs of such projects. Of some 67 projects on which I have studied data, not one had a completion cost anywhere near the preliminary estimate. Following is a list of projects currently operating in the Southeast with original estimates and completion costs:

State	Project	Installed capacity	Original estimate	Completion cost
		Kilowatts		
Virginia	Philpott	14,000	$4,700,000	$13,300,000
Do	Kerr	204,000	31,700,000	87,200,000
Georgia and South Carolina	Clark Hill	280,000	28,000,000	83,600,000
Georgia	Allatoona	74,000	11,800,000	31,900,000

Source: Edison Electric Institute.

[1] U.S. Army Engineer District. Savannah. Savannah River, Ga., Review Report, Savannah, Ga., July 1, 1959.

[2] Wall Street Journal, New York, Apr. 21, 1960.

Economic soundness and feasibility continue to be claimed, by Federal agencies, regardless of final costs.

The rate of population increase in the Southeast, as well as certain other sections, is very high. Many young people, born, reared and educated in this area, are finding it necessary to secure satisfactory employment elsewhere—in many instances outside of the South. Such migration detrimentally affects the economy of the area in many ways, two of which are—

(1) The Southeast loses the economic productivity of the people who migrated; hence the economic development of the area will be retarded. This makes the burden of supporting necessary local governmental services, particularly the schools, fall more heavily upon the productive population left in the area.

(2) South Carolina, as well as other Southern States, in effect, will be subsidizing the economic development of other areas by rearing and educating their future citizens up to the point where they become economically productive. This will tend to perpetuate and intensify a situation that has beset the South for many years, but which has in recent years shown signs of changing.

The effects noted above can best be avoided by having a substantial and continuous growth of employment opportunities within the area concerned.

From the viewpoint of competitive industrial and agricultural development, it is dangerous and unwise for the Federal Government to acquire control of the water resources of a region. Development of an area requires, as a general rule, that industrial plants and farms have access to water for use in production operations and for waste disposal as well as for domestic use. Such development also requires that the water be made available in generous amounts with a minimum of legal and administrative impediments, and that increased amounts be readily available in the future to provide for plant expansion and technological changes. No State, county, or municipality can guarantee industrial and agricultural water supplies if the water involved is impounded in federally owned reservoirs subject to Federal regulation and control. The withdrawal of water from such impoundments and the dumping of waste material into them are governed by rules arbitrarily imposed by the responsible Federal agency or by the National Congress. This means that industrial and agricultural potential and the employment opportunity of a community would likely be determined by people who have no personal interest whatsoever in the economic welfare of the people of that community. Or worse yet, such determinations could be made by people who are actually antagonistic toward the economic growth of the area concerned.

All who are interested in industrial and agricultural development of their respective States should oppose the building of any more large dams by any agency of the Federal Government unless it can be shown conclusively that such is the best way to promote the long-run economic development of a particular area. Those who believe that economic, social, and national defense problems would be partially solved by industrial decentralization should join them in their opposition.

Specific needs for water-resource control and development do not necessarily transcend the various geographic, political, and social boundaries within the United States. Water policies which may be desirable for Nevada, where 87 percent of the State is federally owned, may not necessarily be applicable to the needs of South Carolina. Population density, growth and industrial potential are certainly very real criteria for judging water policy needs. Such criteria are very different in different sections of the country. This serves to emphasize the philosophy that matters pertaining to water policy should be left to, and where applicable should be returned to, State, and local control.

We have included in our testimony tabulated data, on several industrial processes, which show the value of water as an industrial resource. Careful study of these figures would seem to indicate the profligacy involved in bartering one of our most valuable resources to the Federal Government for a handout in the form of an inefficient powerplant and a fishing hole of doubtful need and capability.

We are opposed to the "big-dam" technique of water resource development for the following reasons:

(1) Upstream conservation measures such as reforestation, sound soil and water conservation practices and small detention reservoirs will result in greater net conservation and more strategic dispersal of water supplies. Such practices should be under local control.

(2) Big dams provide virtually no means for raising the general water table since insoak area is relatively small compared with upstream and watershed-wide practices.

(3) Big dams on main streams and tributaries inundate large acreages of our best farmland.

(4) In low-gradient streams and runoff areas, great damage accrues to farmlands and tributary streams due to backwater sedimentation.

(5) The multipurpose theory of construction for water conservation and hydroelectric power production is based on two purposes which are inherently antagonistic.

(6) Big dam development acts as a deterrent to industrial and agricultural growth because of the right to use impounded waters being severely restricted if not prohibited.

(7) Many benefits and claims of economic feasibility for big reservoir projects are based on unrealistic and fictitiously created data. Claims made in original proposals never seem to develop after operation begins. For example, Federal projects now operating within the jurisdiction of the Southeastern Power Administration have accrued losses (on electric energy producing facilities only) of over $11 million. In fiscal 1958 alone these electric facilities lost in excess of $3.60 million.[2] Yet these projects were proposed as self-reimbursing and even as profitmaking ventures. These losses do not include tax losses to Federal, State, or local governments—nor do they include tremendous losses resulting from the inability of private investors to develop the areas.

(8) Water resources should be developed for maximum production and employment. Such is not a characteristic feature of federally built big-reservoir impoundments.

(9) By their very nature, Federal construction of large reservoir projects is characterized by extravagant spending simply because it is extremely difficult, if not impossible, to obtain competent preliminary estimates. Completion costs have run as high as 580 percent of original estimate.

(10) Much of the support for construction of federally owned water-impounding facilities is based on collectivist and socialistic theories.

I do not profess to know what is best for every area of the country. I do believe, however, for the South in general and South Carolina in particular, we will be much better off with private development of our water resources under such regulatory statutes as our State and local governments find necessary to impose. I think your committee and the Congress can exert tremendous influence for the good of our country by selling the people on the idea that our valuable natural resources, including water, soil and people must, most effectively and frugally, be developed and protected at the local level—developed and protected in keeping with problems and responsibilities peculiarly different in different sections of the country.

I recently heard the senior Senator from South Carolina, in a televised statement, predict the dire consequences of having the South lynched at the end of a legislative rope. Similarly, in my opinion such an economic noose is, under the guise of "public resource development for all the people," being tightened around the necks of future generations by contemporary Government-in-business ventures, the rope of this noose fashioned of the ideological materials of bureaucratic expendiency, waste and self-perpetuation, and woven by the machinations of politically sanctioned prodigality. I sincerely hope it's not too late.

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[2] 86th Cong., 1st sess., hearings before the Subcommittee of the Committee on Appropriations. (Testimony of Charles W. Leavy, Administrator, Southeastern Power Administration.)

Productivity and employment per acre-foot of water depleted in manufacturing, and the average productivity of labor (major industry groups, United States, 1954)

Manufacturing industry group	Value added per acre-foot of water depleted [1]	Employment per acre-foot of water depleted	Yearly value added per employee
Printing and publishing	$274,964	34.5	$7,971
Instruments and related products	214,664	27.4	7,820
Tobacco manufactures	183,893	17.4	10,584
Apparel and related products	172,415	39.7	4,341
Miscellaneous manufactures	147,403	23.4	6,312
Fabricated metal industries	135,819	18.1	7,503
Machinery, except electrical	125,439	15.9	7,902
Furniture and fixtures	112,283	19.2	5,863
Leather and leather products	108,519	23.6	4,602
Transportation equipment	93,555	11.6	8,082
Rubber products	90,691	11.4	7,928
Food and kindred products	57,884	6.9	8,359
Electrical industrial apparatus	49,688	6.5	7,611
Stone, clay, and glass products	46,604	5.9	7,861
Lumber and wood products	38,692	7.7	5,018
Textile mill products	28,676	6.3	4,539
Chemicals and allied products	11,950	.9	12,999
Primary metal industries	11,716	1.4	8,406
Pulp, paper, and products	8,654	1.0	8,733
Petroleum and coal products	6,584	.5	12,148

[1] Depletion is equal to water intake of domestic and industrial users minus water discharged by such users.

Source: Kneese, Allen V., "Water Resources Development and Use," Federal Reserve Bank of Kansas City. December 1959.

Senator JOHNSTON. Thank you for coming and giving this information.

The next witness is Mr. Arthur M. Williams, Jr., vice president and staff counsel, South Carolina Electric & Gas Co., Columbia, S.C.

STATEMENT OF ARTHUR M. WILLIAMS, JR., VICE PRESIDENT AND STAFF COUNSEL, SOUTH CAROLINA ELECTRIC & GAS CO.

Mr. WILLIAMS. Thank you, Senator Johnston.

Mr. Chairman, and gentlemen of the committee, at the outset, let me thank you for this opportunity to make a statement before your committee. I realize that yours is a difficult and time-consuming task, superimposed, I am sure, upon already busy schedules. I shall therefore make my statement as brief as is commensurate with a proper presentation of the issues involved.

Over the past decade and a half, I have appeared before numerous bodies engaged in hearings concerning our rivers and matters related thereto. A keen interest in these matters has always been evidenced by Americans, because they have realized that the orderly, proper, and equitable development of our rivers is an important factor in our economy.

During the past few years, I have noted—at least in South Carolina—not only an increased interest in this subject, but a change of emphasis in the thinking on this subject. A real concern has been clearly evidenced by substantial segments of our citizenry over preemption of our rivers for Federal projects that are not really needed, and over exercise of control in the use of existing facilities in such a manner as will adversely affect the economy of our State.

I am certain that many of these features will be presented to your committee by persons far abler to do so than I. Therefore I shall address the bulk of my remarks to a situation that confronts the company which I represent, a result intimately related to existing laws of the United States and to bills now pending before the Congress.

This particular situation will clearly illustrate how use can be made of Federal powers to fasten increased charges onto the expenses which must go into making electric rates. This authority can be used to force these prices up in one section of the country in an attempt to slow down the industrial development already burgeoning there.

I would like to congratulate Senator Murray of your committee and I am sorry the Senator could not make this trip on his S. 1782, which is a bill designed to ameliorate some of the inequities of this situation. His colleagues in the House, Congressman Metcalf, and our own able South Carolinian, Robert W. Hemphill, have introduced similar legislation in the House. It should be noted that representatives of rural electrification cooperatives, investor-owned public utilities and public power districts have appeared in support of these measures.

The South Carolina Electric & Gas Co., which I represent, is an investor-owned utility serving central and southern South Carolina with electricity and natural gas. It has served this section for over 100 years. It has an installed generating capability of 908,480 kilowatts, of which 179,480 kilowatts is hydro and 729,000 kilowatts is steam. During the last year it sold 3.9 billion kilowatt-hours of electricity to 175,496 customers and 10.8 billion cubic feet of natural gas to 35,136 customers.

South Carolina Electric & Gas Co. has maintained on the Savannah River, for approximately 50 years, a hydroelectric facility known as the Stevens Creek plant. Shortly after World War II, the United States, acting through the Army Engineers, completed a dam and hydroelectric generating station a few miles upstream at Clark Hill.

Acting in accordance with authority embodied in the act, and permission from the Secretary of War issued pursuant thereto, under which Stevens Creek Dam was constructed, the Federal Power Commission moved in 1952 to assess the annual charge to be paid by our company to the United States for alleged benefits derived by Stevens Creek plant from the Clark Hill facility.

We were then informed by representatives of the Federal Power Commission that their studies over the period 1950 to 1956, inclusive, had resulted in these significant figures:

(*a*) The benefit to Stevens Creek from Clark Hill amounted to $247,498;

(*b*) The benefit from Stevens Creek to Clark Hill amounted to $318,000; and

(*c*) The damage to Stevens Creek from Clark Hill amounted to $896,900.

Thus it can be seen that if either the damages resulting to our facility from the operation of the Federal facility, or the benefits from our facility to the Federal facility could have been used in computing the annual charge, we would have been relieved of paying anything.

Representatives of the Commission take the position that we cannot offset our benefits to Clark Hill against their alleged benefits to us, and, under the present posture of the law, there is judicial authority to support this conclusion. These same representatives further take the position that while, as a matter of general philosophy, they might allow an offset of Clark Hill's detriments to Stevens Creek against the alleged benefits from Clark Hill to Stevens Creek, in this case they will not. This rather startling conclusion is predicated on the well-known legal principle of damnum absque injuria: loss without injury. The philosophy back of this is that although we were empowered by general and special acts of Congress to construct this dam, the permit issued us by the Secretary of War required us to make water releases in accordance with orders of that official, or those to whom he should delegate such authority.

The representatives of the FPC conclude from this that even though Clark Hill operations are the cause of the water regulation we are requested to follow, that we cannot claim we are legally damaged. There might be some modicum of justification for this if we were trying to force Clark Hill to pay us, but surely there is no legal, equitable, or moral justification for it when all we ask is to use these amounts as offsets. Some of these inequities would be eliminated by the principles embodied in the legislation I have just mentioned.

On last July 16, the General Counsel of the Federal Power Commission testified before the Subcommittee on Power and Communications of the House Committee on Interstate and Foreign Commerce that the principle here involved proceeded on the—

> plain principle of fairness and equity in placing all electric power consumers on an equal footing—those served from Federal powerplants and those served from other powerplants, either publicly or privately owned.

And this brings up a point used in opposition to the bill, namely that the rivers of the United States are owned by the people of the United States and they should not have to pay rent for their property. Like most generalities, this sweeping and unquestionably correct statement embodies two salient reasons why it is not applicable to the case at bar:

(*a*) The charges involved are not charges for water, but are a sharing of the cost of facilities which makes water available for the generation of electricity in more desirable amounts and at more propitious times; and,

(*b*) The consumers of power from non-Federal dams compose a rather large percentage of these same people of the United States in whom is so rightly and justly vested the control of the navigable waters of these 49—and soon to be 50—United States.

The point made in (*a*) above, needs little elucidation. The Federal Power Act itself presently says:

> Whenever any licensee hereunder is directly benefited by *the construction work* of another licensee. * * * [Emphasis added.]

The Federal dams merely using the water of the river do not pay therefor; non-Federal dams do, that is, the license charge to the Com-

mission, as well as certain obligations of no negligible stature assumed by the acceptance of the license.

As to the conclusion raised in (*b*), above, again little clarification is needed. Testimony before a subcommittee of the 2d session of the 84th Congress on H.R. 7468, a bill similar in many respects to the ones I have enumerated above, pointed out that 85 percent of the electric consumers are served by non-Federal facilities. Under present law, consumers served from Federal hydroelectric projects often enjoy benefits of moneys paid by customers of non-Federal facilities, whereas under identical operating facts the converse would not obtain.

As the general counsel for the National Association of Railroad and Utility Commissioners said:

> In the final analysis, it is the consumer who must pay the costs; and while the nationwide effect, dollarwise, of levying benefit charges against both Federal and non-Federal power projects might be nil, nevertheless the consumers of energy generated at individual Federal or non-Federal power projects will receive energy at rates which more accurately reflect the costs of the power.

The investor-owned utilities are closely regulated as to profits by their respective State Commissions and, in some cases, by the Federal Power Commission. Any moneys accruing to them, or any relief from the payment of moneys, arising as a result of the proposed legislation must ultimately redound to the benefit of these consumers. These consumers are, we respectfully submit, just as much Americans—and therefore the possessors of the rights of use and control of the navigable streams—as are the consumers from Federal installations.

I can conclude this phase of my comments, Mr. Chairman and gentlemen, with no better statement than that given so repeatedly before the House subcommittee mentioned above on the 16th day of last July, and in the 1956 hearings referred to, that this provision represents simple equity.

And now I would like to briefly comment on the question of constructing Federal dams upon and along the course of sundry rivers. At the early stages of the development of commercial generation of electrical capacity and energy, hydroelectric generation was a tremendously important factor. With the passing of the years its place has slipped tremendously, due to several factors.

In the first place, the efficiency of thermal generation of electricity has increased enormously, bringing its overall cost into the area of hydroelectric generation. Secondly, the increased value of land has added to the cost of the production of electricity from waterpower. Further, most of the good hydro sites having a close proximity to important load centers have all been used up, and line-loss inherent in transmitting current over long distances has further detracted from the value of new hydroelectric plants. And, of course, there is also the question of dependability—steamplants are not dependent on streamflow or storage reservoirs for a motive source. Summer droughts do not shut them down. There is no need for a large percentage of expensive machinery to stand idle because there is no water to turn their turbines.

A flooding of hundreds, often of thousands or hundreds of thousands of acres of land by reservoirs not only permanently removes them from use for agricultural purposes, but seriously hampers industrial development. We in the South are on the march—industry is coming into our area, and local enterprises are expanding. Most industry needs water—large supplies of it. To find huge areas taken out of circulation for this purpose will deter many industries from locating in the area. And reservoir water is in many cases unusable: Moving water is needed from a sanitary and mechanical standpoint. Utilities will not be able to locate steamplants needed in the area on such reservoirs for, while not needing water to the same extent that hydroplants require it, such plants utilize streamflow for cooling purposes in their condensers.

I realize that in many instances attempts are made to justify these so-called multipurpose dams on the grounds that they are chiefly flood control projects. I really think we are all a little too old and experienced to any longer accept this myth. A few such projects may in good faith be constructed with flood control purposes in mind. But we all know perfectly well that the vast majority of them are constructed and used solely as sources for the generation of electricity. So much so that we have seen projects ostensibly constructed for navigation and flood control building and operating huge steam electric generating plants.

In conclusion, I would also like to point out that many of these so-called flood control projects permanently inundate far more land than has at any known time been affected by floods. These acres are also permanently lost to the economy for the development of farms, pastures, and industry.

Thank you, sir.

The CHAIRMAN. We certainly thank you, Mr. Williams.

Senator JOHNSTON. The next witness is Mr. Walter Wood of the West Virginia Pulp & Paper Co. of Charleston, S.C.

STATEMENT OF WALTER WOOD, WEST VIRGINIA PULP & PAPER CO.

Mr. WOOD. Senator Kerr, and members of the committee, all of the pulp and paper mills in South Carolina, which are Bowaters Carolina Corp., Catawba, S.C., International Paper Co., Georgetown, S.C., Sonoco Products Co., Hartsville, S.C., and West Virginia Pulp & Paper Co., Charleston, S.C., have cooperated to furnish your committee with this statement relative to present and future needs for water and we hope you will find this statement to be of value in your considerations of the all important water problem for now and the future.

The above mentioned mills directly employ more than 4,300 people in the direct operation of their mills and an additional 2,600 people in converting and other operations in the State of South Carolina. It is estimated that an additional 4,700 men are independently employed in procuring, cutting, and transporting the pulpwood to the mills. We will not attempt to enumerate the other people who are

gainfully employed because of the pulp and paper mill operations in South Carolina.

We use approximately 131 million gallons of fresh water per day and we anticipate that by 1980 our industry in the State will be using 232 million gallons of fresh water daily.

Water is just as important as pine trees. We know that we are large users of water. But in our mill operations we use it over and over and at least 90 percent of the water entering our mills is placed back in circulation. So we are users of water and not consumers.

The CHAIRMAN. At that point would you tell the committee of any difference between the quality of the water placed back in the stream as compared with the quality of the water taken from the stream?

Mr. WOOD. This varies, Senator, depending on the particular type of mill, the particular type of pollution abatement equipment that is used and it would vary from mill to mill.

The CHAIRMAN. You represent these four groups?

Mr. WOOD. Yes. I am representing the industry in South Carolina, sir.

The CHAIRMAN. Do you have the data on how many mills there are?

Mr. WOOD. Just the four.

The CHAIRMAN. There is a difference between the degree of pollution of the water returned to the stream as between mills?

Mr. WOOD. Yes, sir. They make different types of paper. Their pulp processes are different. Their recovery systems would be different. They are different systems.

The CHAIRMAN. Is it possible to have the same degree of freedom from pollution of the water returned to the streams at each of the mills?

Mr. WOOD. I would doubt it. I mean I suppose it is possible. I do not think it would be very practicable. I think that, as I say, although they are all paper products, the mills in their operations are quite different.

The CHAIRMAN. The industry has made great progress in the development of processes to relieve the effluent from pollution. I was just asking if you know and would care to give the committee the information as to the relative development in the mills you refer to in that regard.

Mr. WOOD. About the only thing that I would quote would be that pollution through the years has been reduced in the effluent probably around 50 percent.

The CHAIRMAN. Then that would mean that 50 percent of the amount of pollution originally in effect is still in effect?

Mr. WOOD. I would think that that was probably correct.

The CHAIRMAN. What kind of laws does the State of South Carolina have in that regard?

Mr. WOOD. Sir, I believe it ties in with their known streamflow. Our mills use the dilution method of disposing and presumably tie in. I am not too familiar with the specific laws governing it. We can get you that information.

The CHAIRMAN. I would be very grateful to you if you would put into the record the digest of the State laws in that regard, and also your statement as to the extent of the effectiveness of the laws. In other words, from the standpoint of whether or not your improvement in the abatement of pollution is a thing that is progressing, whether or not under the law there are certain goals to be reached and if they are to be reached on a variable time basis or whether or not any pollution now in effect is there in spite of the mandate in the law to have removed it previously.

Senator JOHNSTON. Is there a possibility to return the water with the same amount of pollution it had when you first started using it?

Mr. WOOD. Is it possible to do this?

Senator JOHNSTON. Is it possible?

The CHAIRMAN. With no more pollution.

Senator JOHNSTON. With no more pollution than when you first received the water.

Mr. WOOD. Under present mill operations, I would doubt this. Perhaps if I continued with the statement some of these things might be answered.

Senator JOHNSTON. Are you making any kind of experiments to try to rid the water of being as polluted as much as it is now when your return it to the stream?

Mr. WOOD. Yes, sir. We are going to cover some of that in the statement.

Senator JOHNSTON. Have you had any complaints with the fish being killed in the stream below when you return it?

Mr. WOOD. I do not have any specific instances.

Senator JOHNSTON. The only thing this committee is trying to get at is to try to return the water just as clear of pollution as you possibly can and at the same time not demand too much, of course, of the industry. You can see what we are driving at.

Mr. WOOD. Yes, sir.

Senator SCHOEPPEL. I would like to ask this question. I am well aware of your great industrial expansion and of the locales requiring uses of much water and their development adjacent to the great waterways. You do not get, I am sure, water that is not polluted. It certainly is not free of pollution when you get it in your industrial concerns. I am sure I am right on that.

Mr. WOOD. That is correct.

Senator SCHOEPPEL. But as the distinguished Senator from your own State here has said, this increased population which is coming, together with the increase in industrialization of all types and kinds, and they are bringing problems that we must seriously consider. Hence this long-range view of how we are going to utilize this water, and how we are going to be able to release it the way we find it. We hope we can find it in better shape than we are now finding it generally in a lot of sections of our country.

Do you know of any studies that have been made here with reference to the present type of pollution on your interstate streams here,

that has affected your fish, your game fish of all types and kinds? Do you know of any? If there are, I would like to have that in the record in an abbreviated sort of a way.

In other words, is it getting worse? Are we driving the fish out of these streams by the industrial use of the waters on these streams by not putting it back in properly treated? That is what I am trying to get at.

Mr. WOOD. Yes, sir. I would feel that the condition is improving. We no longer are permitted just to dump any waste into the streams.

Senator SCHOEPPEL. I am sure of that because the States are getting cognizant of that.

Mr. WOOD. Surely. There are fish living now in areas I am sure where 50 years ago they could not live. In view of the exploding population I am sure that we are all going to have, the reason for the committee and the——

The CHAIRMAN. Half the people in this country are using second-hand water now.

Mr. WOOD. Yes, sir.

The CHAIRMAN. And that is going to increase tremendously. The time will come when all of the water in the country will be reused to an extent that the average will be reused water. Our ability, as the Senator has said, to continue to support this increase in population is going to be tied into our ability to assure the user downstream that the health and welfare of the people in that area will not be jeopardized by reason of preventible pollution occurring above them on the stream. That is the basis of our inquiry and the questions the Senator has asked you.

Mr. WOOD. Our industry in South Carolina helps produce water. The millions of acres of land that are being used to grow trees are also helping to produce and regulate the water supply of our State.

Ours is an industry that in addition to helping produce water is also helping the general economy of our State by seeing that more pine trees are planted every year than are cut. We are not depleting our natural resources. Ours is an industry that provides or returns more natural resources than it uses.

Ours is also an industry which has, at great expense, taken barren or cutover lands and replanted them with pine trees. In this program we have returned thousands of acres of land to a productive and taxable basis. This program also means that these thousands of acres are protected from soil erosion and afford additional areas for water retention and thus help build up the water supply of the State and Nation.

We believe that adequate laws could be adopted by the individual States and we are firmly convinced that the control of water supplies should be left to the individual States or should be regulated by mutually agreed upon interstate compacts. It is not believed that these problems can be reasonably and effectively regulated or controlled by the Federal Government.

It is believed that it is desirable to have the Federal Government recognize that the States themselves have an unchallengeable right of ownership of the water in the State as far as the right of alloca-

tion is concerned and that any policy statement made by any combination of governmental agencies covering water rights should give clear recognition to this fact.

We believe that the States have ample power to preserve and protect the natural resources of the States concerned, and with respect to any water separating the States or flowing through the States, ample powers exist to preserve required standards.

We feel that the pollution of streams is a matter that pertains directly to health; and the discharge of substances into the waters of the State which are harmful to human, animal and aquatic life, is prohibited by law; and the law can be adequately enforced.

The CHAIRMAN. But you tell us it is being enforced to the extent of eliminating so far only half of the pollution.

Mr. WOOD. I said that would be my approximate.

The CHAIRMAN. Approximate?

Mr. WOOD. Yes, sir. There is a continuing program and I will refer to this, also.

The CHAIRMAN. That is what I am asking you to put into the record.

Mr. WOOD. With respect to streams separating or flowing through two or more States, compacts or agreements between the States concerned have been found to be a satisfactory method of resolving differences.

The subject of water pollution control, as important as it is now, will become almost of paramount importance in the national water conservation picture as the years go by and the water supply of the Nation continues to tighten.

The disposal of all the waste waters produced by the paper mills in South Carolina is carried out on a dilution basis, relying on a sufficient volume of water being available to dilute the effluent so that the resulting blend is of good quality.

The pulp and paper industry is not a consumer of water as much as it is a user of water. As I said previously, fully 90 percent of the total water used in a mill is returned to the water course. In the old days this water was in poor condition, but by various changes made in the mill processes almost 50 percent of the pollution load has been removed from the waste originating in some pulp and paper processes. The organic matters removed from the waste are either recovered or burned. This means that, given suitable amounts of dilution water, the waste water can be discharged without causing any decrease in water quality of the receiving stream.

We in the pulp and paper industry recognize the pollution problem and we have been doing something about it. In 1943 a group of pulp and paper mills formed the National Council for Stream Improvement. Today approximately 225 pulp and paper mills are members of this council and our industry is spending over $1 million each year in research alone. In addition, the individual mills in our industry have spent over $100 million in the past 10 years in construction of treatment facilities—all to keep our rivers and streams in the best of health.

Little or no steps have been taken in the past to assure that desirable minimum flow figures would be maintained below dams constructed by either public or private utilities or by the Corps of Engineers and the Bureau of Reclamation. In many instances the power generated at the dams is so-called peak power, produced for a limited time each day, which in turn sets up a periodic discharge of water. This type of discharge is unsatisfactory for dilution purposes as well as other purposes such as maintenance of aquatic life and recreation.

Senator SCHOEPPEL. I might add at this point that this is one of the difficult problems we have and these States have confronting them, is it not?

Mr. WOOD. That is right.

Senator SCHOEPPEL. Because on the use of the peak load requirements and then abating them and cutting them out altogether for awhile, your dilution processes that you rely on to be satisfactorily balanced is thrown completely out of balance, are they not?

Mr. WOOD. Yes, sir.

Senator SCHOEPPEL. And I think you put your finger on a serious problem there that some place down the line has to be taken into consideration if we are going to whip this thing.

Mr. WOOD. We feel that minimum flow figures should be written into bills authorizing dams built by Federal agencies, and when built by public or private utilities the minimum continuous discharge figures should be specified in the construction permits.

Gentlemen, if this statement does not give you all of the information you desire, please feel free to call on us for additional information that you need.

The CHAIRMAN. Thank you, Mr. Wood, for a very good statement.

Senator MARTIN. May I ask one question?

The CHAIRMAN. Senator Martin.

Senator MARTIN. Is the waste water you refer to part of the 90 percent you return?

Mr. WOOD. Yes, sir. Water is used in almost every part of the papermaking process. You put it in one place and take it out, and as we have indicated, very little is consumed. So it is an input-output type of thing.

Senator MARTIN. Is there any other consumption of that water, that 10 percent that you consume, is any part of that to any other use or category?

The CHAIRMAN. It is evaporation, is it not?

Senator MARTIN. Or category other than evaporation?

Mr. WOOD. Paper has a moisture content. Some of it, of course——

Senator MARTIN. It is used up in the product?

Mr. WOOD. Yes, I mean even this paper has moisture content.

Senator MARTIN. Removed from the water supply in the product that you have?

Mr. WOOD. The evaporation would have some effect. There is a moisture content in paper. I think it would be—I do not know what the volume would be there.

Senator MARTIN. I just do not know enough about the paper industry to know how you use the water. I wondered if the 10 percent is primarily evaporation or some of it goes out in the papermaking process.

Mr. WOOD. Most paper has perhaps here again approximately 3 percent water or something like that, enough so that it won't become brittle and break. If you consider that used in the process, I guess it is. I would imagine that a large percentage would be evaporation and just through loss, incidental loss almost.

Senator MARTIN. Is all of your waste material turned back into the stream or is it put out into a hole in the ground?

Mr. WOOD. This varies with the type of mill. I am most familiar with recovery processes where the waste is reclaimed. For example, in the making of pulp, when your pulp is in the liquid stage it is maybe over 90 percent water. You recover as much of that organic material as you can from the water to put it back into the process because it is uneconomical to discharge pulp in the stream, even not taking into consideration the pollution effects. You recover as much of your reusable material as possible. Most of the chemicals used in papermaking would be recovered, both to prevent pollution and from an economic reason.

Senator MARTIN. We had a problem in one of the hearings about waste material being put into the ground in such a way as to get into the ground water and create some difficulty because of that. Have you had any problem of that kind?

Mr. WOOD. None that I know of. Most of our material, of course, is organic in nature and pulp will go back into natural state.

Senator MARTIN. The biggest problem we have, then, on the matter of pollution is in the water returned to the stream?

Mr. WOOD. That would be my feeling at this time. We never had complaints.

Senator MARTIN. My opinion that I got from your statement is that there has been considerable progress up to date in clearing that water and that you anticipate even still further improvement.

Mr. WOOD. Yes, sir. We would like to have 100 percent. In other words, the water purer than when it came into the mill. And I think that is our goal if we are discussing goals. But we have not yet arrived.

Senator MARTIN. That is one of our goals, also.

That is all.

Mr. WOOD. Thank you, gentlemen.

Senator JOHNSTON. Do you have any complaint about the air being polluted in any places?

Mr. WOOD. Very seldom, sir.

Senator JOHNSTON. Very seldom?

Mr. WOOD. Yes, sir.

(The information furnished by the witness with respect to the laws of South Carolina in response to the chairman's request is as follows:)

SOUTH CAROLINA WATER POLLUTION CONTROL LAW

SOUTH CAROLINA WATER POLLUTION CONTROL AUTHORITY

c/o South Carolina State Board of Health
Columbia, South Carolina

Sec.

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Sec.

70-120. Discontinuance of existing discharge when ordered.

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70-136. Holding and disbursement of funds.

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§ 70-101. Definitions.

When used in this chapter the following words and phrases shall have the meanings ascribed to them in this section:

(1) "Person" means any individual, public or private corporation, political subdivision, government agency, municipality, industry, copartnership, association, firm, trust, estate or any other legal entity whatsoever;

(2) "Waters" shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic Ocean within the territorial limits of the State and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt, which are wholly or partially within or bordering the State or within its jurisdiction;

(3) "Marine district" shall include the waters of the Atlantic Ocean within three nautical miles from the coast line and all other tidal waters within the State;

(4) "Sewage" means the water-carried human or animal wastes from residences, buildings, industrial establishments or other places, together with such ground water infiltration and surface water as may be present and the admixture with sewage, as above defined, of industrial wastes or other wastes, as hereafter defined, shall also be considered "sewage" within the meaning of this chapter;

(5) "Industrial waste" means any liquid, gaseous, solid or other waste substance or a combination thereof resulting from any process of industry, manufacturing, trade or business or from the development of any natural resources;

(6) "Other wastes" means garbage, refuse, decayed wood, sawdust, shavings, bark, sand, clay, lime, cinders, ashes, offal, oil, tar, dye stuffs, acids, chemicals, dead animals and all other substances not sewage or industrial waste which may cause or tend to cause pollution of the waters of the State;

(7) "Pollution" means the discharge or deposit into the waters of the State of sewage, industrial waste or other wastes, or the effluent therefrom, in such manner, conditions or quantity as may cause such waters to be contaminated, unclean, noxious, odorous or impure to such extent as will or may contravene the standards of quality and purity established by the Authority for such waters as provided in this chapter;

(8) "Standard" or "standards" means such measure of purity or quality for any waters in relation to their reasonable and necessary use as may after hearing be established by the Authority pursuant to §§ 70-112 to 70-114 and §§ 70-125 to 70-129;

(9) "Authority" means the Water Pollution Control Authority of South Carolina;

(10) "Sewage system" or "sewerage system" means pipe lines of conduits, pumping stations, force mains and all other construction, devices and appliances appurtenant thereto used for conducting sewage, industrial waste or other wastes to a point of ultimate discharge;

(11) "Treatment works" means any plant, disposal field, lagoon, constructed drainage ditch or surface water intercepting ditch, incinerator, area devoted to sanitary land fills or other works not specifically mentioned herein, installed for the purpose of treating, neutralizing, stabilizing or disposing of sewage, industrial waste or other wastes;

(12) "Disposal system" means a system for disposing of sewage, industrial waste or other wastes, including sewerage systems and treatment works;

(13) "Outlet" means the terminus of a sewer system or the point of emergence of any water-borne sewage, industrial waste or other wastes, or the effluent therefrom, into the waters of the State; and

(14) "Shellfish" includes oysters, scallops, clams, mussels and other aquatic mollusks and lobsters, shrimp, crawfish, crabs and other aquatic crustaceans.

1950 (46) 2153.

§ 70-102. Policy of State.

It is hereby declared to be the public policy of the State that reasonable standards of purity of the waters of the State be maintained, consistent with public health, the public enjoyment of such waters, the propagation and protection of fish, shellfish and wildlife, the operation of existing industries and the future industrial development of the State with a reasonable balance of consideration of the public welfare and, to that end, that the use of reasonable methods to prevent and control pollution of the waters be required.

1950 (46) 2153.

Cross reference. – As to pollution and poisoning of waters to injure or catch fish, see §§ 28-671 to 28-677.

§ 70-103. Water Pollution Control Authority of South Carolina.

There is hereby created within the State Health Department the Water Pollution Control Authority of South Carolina consisting of ten members.

1950 (46) 2153.

§ 70-104. Appointment of members of Authority.

Seven members of said Authority shall be appointed by the Governor for a term of office of four years, the first appointments, however, having been one member for one year, two for two years, two for three years and two for four years. Two members of the Authority shall be named by the executive committee of the State Board of Health from within its membership to serve at the pleasure of said executive committee, and the State Health Officer, serving ex officio, shall at all times be a member of the Authority and shall serve as its chairman. The appointments by the Governor shall be made as follows: one member from a list of three names submitted by the Cotton Manufacturers' Association of South Carolina, one member from a list of three names submitted by the pulp and paper industry, one member from a list of three names submitted by the South Carolina Wildlife Federation, one member from a list of three names submitted by the Municipal Association of South Carolina, one member who shall be a farmer actually engaged in active farming and two members from a list of three names from the ranks of labor to be submitted by the Commissioner of Labor. At least two members shall represent labor.

1950 (46) 2153

§ 70-105. Compensation and expenses of members.

The appointive members of the Authority shall receive the legal per diem for their services when in attendance at official meetings or assignments. They shall be allowed travel and subsistence in accordance with the State schedule when in the performance of their duties.

1950 (46) 2153.

§ 70-106. Organization; executive director.

The members of the Authority shall organize and select an executive director. The executive director shall have such authority and perform such duties as may be directed by the Authority.

1950 (46) 2153.

§ 70-107. Control of pollution.

The Authority shall have jurisdiction to abate, control and prevent the pollution of the waters of the State.

1950 (46) 2153.

§ 70-108. Rules and regulations.

The Authority shall adopt, prescribe and promulgate rules and regulations to implement this chapter and to govern the procedure of the Authority with respect to meetings, hearings, filing of reports, the issuance of permits and all other matters relating to procedure and may amend or cancel any such rule or regulation.

1950 (46) 2153.

§ 70-109. Standards; use of streams.

The Authority, after public hearing as herein provided, shall adopt standards and determine what qualities and properties of water shall indicate a polluted condition and these standards shall be promulgated and made a part of the rules and regulations of the Authority as herein provided. The Authority, in determining standards and designating the use of streams shall be guided by the limitations and purposes of this chapter.

1950 (46) 2153.

§ 70-110. General powers of Authority.

The Authority may:

(1) Safeguard the waters of the State from pollution by (a) minimizing any new pollution and (b) abating pollution existing when this law was adopted on May 4 1950 in the manner provided in this chapter;

(2) Hold public hearings, compel attendance of witnesses, make findings of fact and determinations and assess such penalties as are herein prescribed, all with respect to the violations of the provisions of this chapter or the orders issued by the Authority;

(3) Make, revoke or modify orders requiring the discontinuance of the discharge of sewage, industrial waste or other wastes into any waters of the State resulting in pollution in excess of the applicable standards established under § 70-109 and specifying the conditions and time within which such discontinuance must be accomplished;

(4) Institute or cause to be instituted in a court of competent jurisdiction legal proceedings to compel compliance with the pro-

visions of this chapter or the determinations and orders of the Authority;

(5) Issue, continue in effect or deny permits, under such conditions as it may prescribe, for the prevention and abatement of pollution, for the discharge of sewage, industrial waste or other wastes or for the installation or operation of disposal systems or parts thereof;

(6) Conduct such investigations as it may deem advisable and necessary for the discharge of its duties under this chapter;

(7) Settle or compromise in its discretion any action or cause of action for the recovery of a penalty under this chapter as it may deem advantageous to the State;

(8) Perform such other and further acts as may be necessary to carry out effectively the duties and responsibilities of the Authority prescribed in this chapter;

(9) Cooperate with the governments of the United States or other states or any other agencies or groups of agencies or organizations, official or unofficial, in respect to pollution control matters or for the formulation of interstate pollution control compacts or agreements;

(10) Conduct or cause to be conducted studies and research with respect to pollution abatement or control problems, disposal systems and treatment of sewage, industrial waste or other wastes, by all scientific methods and, if necessary, the use of mobile laboratories;

(11) Prepare and develop a general comprehensive program for the abatement of existing pollution and the prevention of new pollution;

(12) Require to be submitted to it and consider for approval plans for disposal systems or any part thereof and inspect the construction thereof for compliance with the approved plans;

(13) Serve as the agency of the State for the receipt of moneys from the Federal Government or other public or private agencies and expend them for the purpose of pollution control studies, research or otherwise;

(14) Approve projects for which applications for loans or grants under the Federal Water Pollution Control Act are made by any municipality (including any city, town, district or other public body created by or pursuant to the laws of this State and having

jurisdiction over disposal of sewage, industrial wastes or other wastes) or agency of this State or by an interstate agency;

(15) Participate through its authorized representatives in proceedings under the Federal Water Pollution Control Act to recommend measures for abatement of water pollution originating in this State;

(16) Consent on behalf of the State to requests by the Federal Security Administrator to the Attorney General of the United States for the bringing of suit for abatement of such pollution; and

(17) Consent to the joinder as a defendant to such suit of any person who is alleged to be discharging matter contributing to the pollution, abatement of which is sought in such suit.

1950 (46) 2153.

Cross reference. – As to pollution of water supply of city of Greenville, see § 32-1211.

§ 70-111. Benefits of Federal Water Pollution Control Act.

The Authority may take all action necessary or appropriate to secure to this State the benefits of the Federal Water Pollution Control Act, Public Law 845, 80th Congress (62 Stat. 1155), and any and all other Federal and State acts concerning water pollution control.

1950 (46) 2153.

§ 70-112. Classification of waters.

It is recognized that, due to variable factors, no single standard of quality and purity of the waters is applicable to all waters of the State. In order to attain the objectives of this chapter, the Authority, after proper study and after conducting a public hearing upon due notice, shall group the designated waters into classes. Such classification shall be made in accordance with considerations of best usage in the interest of the public and with regard to the considerations mentioned in § 70-109. Such classification may from time to time be altered or modified by the Authority. Standards of quality and purity for each such classification shall be adopted by the Authority in relation to the public use or benefit to which such waters are or may in the future be put and with regard to the considerations mentioned in § 70-109. Such standards may from time to time be altered or modified by the Authority.

The adoption of a classification of the waters and the standards of quality and purity above prescribed shall be made by the Authori-

ty only after public hearing on due notice as provided by this section, § 70-109 and §§ 70-125 to 70-129.

1950 (46) 2153.

§ 70-113. What standards may prescribe.

The standards adopted pursuant to § 70-112 may prescribe:

(1) The extent, if any, to which floating solids may be permitted in the water;

(2) The extent to which suspended solids, colloids or a combination of solids with other substances suspended in water may be permitted;

(3) The extent to which organisms of the coliform group (intestinal bacilli) or any other bacteriological organisms may be permitted in the water;

(4) The extent of the oxygen demand which may be permitted in the receiving waters; and

(5) Such other physical, chemical or biological properties as may be necessary for the attainment of the objectives of this chapter as set forth in § 70-102.

1950 (46) 2153.

§ 70-114. Considerations for classification and standards.

In adopting the classification of waters and the standards of purity and quality to be adopted pursuant to § 70-112 consideration shall be given to:

(1) The size, depth, surface area covered, volume, direction, rate of flow, stream gradient and temperature of the water;

(2) The character of the district bordering such water and its peculiar suitability for the particular uses and with a view to conserving it and encouraging the most appropriate use of the lands bordering on such water for residential, agricultural, industrial or recreational purposes;

(3) The uses which have been made, are being made or may be made of such waters for transportation, domestic and industrial consumption, irrigation, bathing, fishing and fish culture, fire prevention, sewage disposal or otherwise; and

(4) The extent of present defilement or fouling of such waters which has already occurred or resulted from past discharges therein.

1950 (46) 2153.

§ 70-115. Filing rules, regulations, classifications and standards.

The rules and regulations of the Authority as provided in § 70-

108 and the classification of waters and standards adopted as provided in §§ 70-109 and 70-112 to 70-114 shall, before becoming effective, be filed with the Secretary of State.

1950 (46) 2153.

§ 70-116. Unlawful to cause or permit pollution of waters in contravention of standards.

It shall be unlawful for any person, directly or indirectly, to throw, drain, run, allow to seep or otherwise discharge into any of the waters of the State or cause, permit or suffer to be thrown, drain, run, allowed to seep or otherwise discharged into such waters organic or inorganic matter that shall cause or tend to cause a condition of pollution in contravention of the standards adopted by the Authority.

1950 (46) 2153.

§ 70-117. Permit required to discharge sewage or waste through new outlet into waters.

Any person desiring to make or cause to be made any new outlet for the discharge of sewage, industrial waste or other wastes, or the effluent therefrom, into the waters of the State, shall first make an application to the Authority for a permit to construct and use such outlet. If, after hearing, the Authority finds that the discharges from such proposed outlet will not be in contravention of the standards adopted by the Authority, such permit shall be issued to such applicant. No person shall make or cause such outlet to be made without the prior issuance of such permit by the Authority.

1950 (46) 2153.

§ 70-118. Permits for construction, change, etc., of sewage disposal systems required.

It shall be unlawful for any person, until plans therefor have been submitted to and approved by the Authority and a written permit therefor shall have been granted by the Authority, to:

(1) Construct or install a disposal system which shall have as its object the discharge of sewage, industrial waste or other wastes, or the effluent therefrom, into the waters of the State;

(2) Make any change in, addition to or extension of any existing disposal system or part thereof that would materially alter the method or the effect of treating or disposing of the sewage, industrial waste or other wastes;

(3) Operate such new system or such existing system as so changed, added to or extended; or

(4) Increase the load through existing outlets of sewage, industrial waste or other wastes into the waters of the State.

1950 (46) 2153.

§ 70-119. Discharge of sewage or waste into waters of marine district.

Sewage, industrial waste or other wastes shall not be placed or allowed to run into the waters of the marine district or waters tributary thereto in contravention of the standards adopted by the Authority pursuant to §§ 70-112 to 70-114. But in the case of such discharges as were in existence on May 4 1950 no final order of discontinuance shall be entered until five years after service of an order of the Authority, except that the State Board of Health may summarily order the discontinuance of the discharge of any waste that is found to be a menace or hazard to public health.

1950 (46) 2153.

§ 70-120. Discontinuance of existing discharge when ordered.

Any person who on May 4 1950 was discharging sewage, industrial waste or other waste into any of the waters of the State, without regard to the time that such discharge began or whether such continued discharge has been by virtue of a permit issued by the State Health Officer in accordance with the provisions of § 5002 of the Code of 1942, shall discontinue the discharge of such sewage, industrial waste or other wastes into, or in such manner or quantity as to cause pollution of, the waters of the State upon receipt of a final order of the Authority issued pursuant to the provisions of §§ 70-110, 70-112 to 70-114 and 70-125 to 70-129. But in the case of such discharges, except those discharges causing an actual or potential hazard to public health, no final order of discontinuance of discharge shall be entered until one year after service of an order of the Authority determining that such discharge constitutes pollution in contravention of the standards adopted by the Authority and directing the alleged polluter to take such steps as may be necessary to abate the polluting content of such discharge to conform to the standards of the Authority.

1950 (46) 2153.

§ 70-121. Effect of inability to comply with standards or orders.

Notwithstanding any of the other provisions of this chapter, if,

after public hearing, the Authority finds that it is impossible or impracticable for any person to comply with the standards, determinations or orders of the Authority as to the treatment of sewage, industrial waste or other wastes because no adequate or practical method of disposal or treatment is known, the Authority shall not order the abatement or cause suit or action to be brought to prevent or abate the discharge of such sewage, industrial waste or other wastes by such person during such period of time, not in excess of five years, as the Authority determines necessary in order to provide means for disposal or treatment of such sewage, industrial waste or other wastes so as to comply with such recommendations or such requirements. Extensions of time beyond the five-year or shorter period may be granted by the Authority after public hearing if the person involved shows to the satisfaction of the Authority that he has diligently tried to comply with the orders of the Authority. In all proceedings under this section the burden of proof shall be upon the person seeking a postponement, stay, extension of time or other relief. But the State Board of Health may summarily order the discontinuance of the discharge of any waste that is found to be a menace or hazard to public health.

1950 (46) 2153.

§ 70-122. Violations excused.

The civil and criminal liabilities herein imposed upon persons violating the provisions hereof shall not be construed to include any violation which was caused by an act of God, war, strike, riot or other catastrophe as to which negligence on the part of such person was not the proximate cause.

1950 (46) 2153.

§ 70-123. Inspections, examinations, etc.

The Authority or its duly appointed agent may enter at all reasonable times in or upon any property, public or private, for the purpose of inspecting and investigating conditions relating to pollution or the possible pollution of any waters of the State. The Authority, or any employee or agent thereof when authorized by it, may examine any records or memoranda pertaining to the operation of a disposal system or treatment works.

1950 (46) 2153.

§ 70-124. Use of laboratory of State Board of Health.

The Authority shall use the laboratory of the State Board of Health as the official laboratory of the Authority.

1950 (46) 2153.

§ 70-125. When hearings held.

Public hearings shall be conducted by the Authority in connection with and prior to action by the Authority in the classification of the waters or the adoption or establishment of standards of purity and quality thereof as provided by § 70-112. The Authority may conduct public hearings in connection with or prior to action in the following cases, either of its own volition or upon the request of persons affected by such order or determination: (a) an order of determination of the Authority requiring the discontinuance of discharge of sewage, industrial waste or other wastes into the waters of the State as provided by §§ 70-109, 70-110 and 70-112, (b) an order denying, revoking or modifying a permit as provided in § 70-110, (c) a determination that a discharge constitutes pollution of waters of a marine district as provided by §§ 70-109, 70-110 and 70-112 and (d) any other proceeding resulting in a finding of fact or determination that a discharge of sewage, industrial waste or other wastes into the waters of the State contravenes the standards established for such waters.

1950 (46) 2153.

§ 70-126. Who may conduct hearings; Authority to decide all matters.

The hearings herein provided for may be conducted by the Authority itself at a regular or special meeting of the Authority or the Authority may delegate to any member or group of members, to the executive director or to any employee or agent of the Authority, the power and authority to conduct such hearings in the name of the Authority at any time and place. But the Authority shall make all necessary decisions as to the matter under consideration.

1950 (46) 2153.

§ 70-127. Record of hearings.

A record, or summary thereof, of the proceedings of such hearings shall be taken and filed with the Authority. If so requested by any person concerned with any such hearing, a full stenographic

transcript, or the actual recording by an acceptable device, of the testimony presented at such hearing shall be made and filed.
1950 (46) 2153.

§ 70-128. Witnesses, production of evidence, etc.

In any such hearing, any member of the Authority, the executive director or any employee or agent thereof authorized by the Authority may administer oaths, examine witnesses and issue in the name of the Authority notices of hearings and subpoenas requiring the attendance and testimony of witnesses and the production of evidence relevant to any matter involved in any such hearing. Witnesses shall receive the same fees and mileage as in civil actions.
1950 (46) 2153.

§ 70-129. Compelling obedience of witnesses, etc.

In case of contumacy or refusal to obey a notice of hearing or subpoena issued under § 70-128, the court of common pleas shall have jurisdiction, upon application of the Authority, to issue an order requiring such person to appear and testify or produce evidence, as the case may require, and any failure to obey such order of the court may be punished by the court as a contempt thereof.
1950 (46) 2153.

§ 70-130. Findings as prima facie evidence.

In any action brought pursuant to this chapter, any finding of the Authority shall be prima facie evidence of the fact so found.
1950 (46) 2153.

§ 70-131. Appeals.

Any person may appeal from any order of the Authority made hereunder, within thirty days after the filing of the order, to the court of common pleas of any county in which the waters involved are located. The Authority shall thereupon certify to the court the record in the hearing. The court shall review the record and the regularity and the justification for the order, on the merits, and render judgment thereon as in ordinary appeals in equity. The court may order or permit further testimony on the merits of the case, in its discretion such testimony to be given either before the judge or referee by him appointed. From such judgment of the court an appeal may be taken as in other civil actions.
1950 (46) 2153.

§ 70-132. Attorney General as legal advisor; prosecutions.

The Attorney General shall be the legal advisor of the Authority and shall upon request of the Authority institute injunction proceedings or any other court action to accomplish the purpose of this chapter. In the prosecution of any criminal action under § 70-133 by the Attorney General and in any proceeding before a grand jury in connection therewith the Attorney General may exercise all the powers and perform all the duties which the solicitor would otherwise be authorized or required to exercise or perform and in such a proceeding the solicitor shall exercise such powers and perform such duties as are requested of him by the Attorney General.

1950 (46) 2153.

§ 70-133. Penalties.

Any person who shall wilfully violate any final determination or order of the Authority promulgated pursuant to this chapter shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not less than one hundred dollars nor more than five hundred dollars or by imprisonment for a term of not more than one year, or by both such fine and imprisonment, for each separate violation. Each day upon which such violation occurs shall constitute a separate violation.

1950 (46) 2153.

§ 70-134. Prosecutions only by Authority.

Prosecutions under § 70-133 shall be instituted only by the Authority and in the name of the people of the State of South Carolina.

1950 (46) 2153.

§ 70-135. Prosecutions not to be instituted pending appeal, etc.

No prosecution under § 70-133 shall be instituted until after final disposition of an appeal or review, if any, provided by § 70-131 nor until after the expiration of any extension of time or a denial of an application therefor pursuant to § 70-121.

1950 (46) 2153.

§ 70-136. Holding and disbursement of funds.

Any funds appropriated to or received by the Authority shall be set up in the State Board of Health as an earmarked fund and so deposited in the State Treasury as provided by law. Such funds shall be paid out on warrants issued by the State as prescribed by law, but only on order of the chairman and executive director of

the Authority and in accordance with an annual budget or amendments thereto approved by the Authority at an official meeting, such order being the authority of the proper fiscal officials of the State for making payment.

1950 (46) 2153.

§ 70-137. Remedies cumulative; estoppel.

It is the purpose of this chapter to provide additional and cumulative remedies to abate the pollution of the waters of the State and nothing herein contained shall abridge or alter rights of action in the civil courts or remedies existing in equity or under the common law or statutory law, nor shall any provision in this chapter or any act done by virtue of this chapter be construed as estopping the State, persons or municipalities, as riparian owners or otherwise, in the exercise of their rights under the common law, statutory law or in equity to suppress nuisances or to abate any pollution.

1950 (46) 2153.

§ 70-138. Actions resulting from violations inure solely to the State.

Causes of action resulting from the violation of the prohibitions contained in this chapter inure solely to and are for the benefit of the people of the State and it is not intended in any way to create new or enlarge existing common law or statutory rights for riparian owners or others. A determination by the Authority that pollution exists or a violation of any of the prohibitions contained in this chapter, whether or not actionable by the State, create no presumption of law or fact inuring to or for the benefit of persons other than the State.

1950 (46) 2153.

§ 70-139. Health laws not affected.

Nothing herein contained shall be construed to postpone, stay or abrogate the enforcement of the provisions of the public health laws of this State and rules and regulations promulgated thereunder in respect to discharges causing actual or potential hazards to public health nor to prevent the State Board of Health from exercising its rights to prevent or abate nuisances.

1950 (46) 2153.

(The foregoing is a reproduction from the 1952 Code of Laws, Title 70, Chapter 3, §§ 70-101 through 70-139, Volume 6.)

CLASSIFICATION-STANDARDS SYSTEM FOR THE STATE OF SOUTH CAROLINA

SECTION I

DEFINITIONS

The definition of any word or phrase employed in Sections II or III shall be the same as given in Section 20, South Carolina Water Pollution Control Law. The following words or phrases which are not defined in said Section, shall be defined or have meanings as follows:

Source of water supply for drinking, culinary or food processing purposes shall mean any source, either public or private, the waters from which are used for domestic consumption, or used in connection with the processing of milk, beverages, foods or for other purposes which require finished water meeting U. S. Public Health Service Drinking Water Standards.

Approved Treatment as applying to water supplies means treatment accepted as satisfactory by the authorities responsible for exercising supervision over the sanitary quality of water supplies.

Bathing shall include swimming but shall be regarded as a best usage only for waters in which bathing is or may be expected to be subject to effective sanitary supervision and control.

Fishing shall include the propagation of fish and other aquatic life.

Agricultural shall include use of waters for stock watering, irrigation and other farm purposes but not as source of water supply for drinking, culinary or food processing purposes.

Marine District waters shall mean all tidal waters which are so designated by the Water Pollution Control Authority and which generally shall have a choloride ion content in excess of 250 parts per million.

Underground Disposal shall mean the disposal of wastes by pumping or allowing to flow by gravity into the ground in such a manner as to enter the water-bearing strata of the earth. Such disposal is not to be permitted. This definition does not cover the use of tile fields in connection with septic tanks, or any other type of ground waste disposal subject to regulations of the State Board of Health.

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Intermittent Discharge of Wastes shall refer to the practice of holding industrial wastes, domestic sewage, or mixtures of the two; or sludge resulting from the operation of plants, processes or systems for the treatment of the same, in lagoons, tanks or other suitable containers for discharge at appropriate times. Such lagoons, tanks, or other containers shall be considered waste treatment plants to be operated on permit of the Authority as specified by the Water Pollution Control Act and shall be operated in the manner specified by the permit.

Controlled Discharge of Wastes and other phrases or words of the same general intent shall be construed the same as *Intermittent Discharge of Wastes.*

Swamp Waters shall refer to waters whose topographical location is such as to cause them to have very low flow velocities, and certain characteristics different from adjacent streams.

SECTION II

RULES APPLICABLE TO CLASSES AND STANDARDS

1. In any case where the waters into which sewage, industrial wastes or other waste effluents discharge are assigned a different classification than the waters into which such receiving waters flow, the standards applicable to the waters which receive such sewage or waste effluents shall be supplemented by the following stipulation: The quality of any waters receiving sewage, industrial wastes or other waste discharges shall be such that no impairment of the best usage of waters in any other class shall occur by reason of such sewage, industrial wastes or other wastes discharges.

2. Tests or analytical determinations to determine compliance or non-compliance with standards shall be made in accordance with methods and procedures approved by the Water Pollution Control Authority. (In approving methods, so far as practicable and applicable, the Authority will be guided by the latest edition of "Standard Methods for the Examination of Water and Sewage" published by the American Public Health Association and the American Water Works Association.)

3. In making any tests or analytical determinations of classified waters to determine compliance or non-compliance of sewage,

industrial wastes or other wastes discharges with established standards, samples shall be collected in such a manner and at such locations as are approved by the Water Pollution Control Authority as being representative of the receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.

4. Natural waters may, on occasion, have characteristics outside of the limits established by the standards. The standards adopted herein relate to the condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes.

5. Where tests for compliance with the fresh water standards for those classifications of B or above disclose that the minimum requirements thereof are being met with regularity at each domestic, industrial, or other water supply intake point, no violation of such classification shall be deemed to exist by virtue of any variation from the requirements thereof which occurs other than at any such intake point, due to the discharge of wastes into any stream so classified, unless the quality of the water at such other point fails to meet the normal requirements of the next lower classification.

SECTION III

ESTABLISHED CLASSES FOR FRESH SURFACE WATERS AND THE STANDARDS OF QUALITY AND PURITY WHICH SHALL BE APPLIED THERETO

CLASS AA

Waters meeting State Board of Health regulations as suitable for use for domestic and food processing purposes with sterilization as only treatment required. Suitable also for uses requiring waters of lesser purity.

Quality Standards for Class AA Waters

Items	*Specifications*
1. Floating solids; settleable solids; oil; sludge deposits; tastes or odor producing substances.	None attributable to sewage, industrial wastes or other wastes.
2. Sewage or waste effluents.	None.
3. Dissolved oxygen.	Not less than 5 ppm.
4. Toxic wastes, deleterious substances, colored or other wastes or heated liquids.	None in amounts to exceed limitations set by State Board of Health for waters for this use.

CLASS A

Waters meeting the State Board of Health regulations as suitable for use as swimming water. Suitable also for other uses requiring waters of lesser purity.

Quality Standards for Class A Waters

Items	*Specifications*
1. Floating solids; settleable solids; oil; sludge deposits.	None which are readily visible and attributable to sewage, industrial wastes or other wastes and which measurably increase the amounts of these constituents in receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.
2. Sewage or waste effluents.	None in such quantity or quality as to raise the Coliform bacteria count of these waters above 1000 per 100 ml.
3. Odor producing substances contained in sewage, industrial wastes or other wastes.	The waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto shall not have an increased threshold odor number greater than 8, due to such added wastes.
4. Phenolic compounds.	Not greater than 5 parts per billion (Phenol)
5. pH.	Range between 6.0 and 8.0, except that swamp waters may range from pH 5.0 to pH 8.0.
6. Dissolved Oxygen.	Not less than 4.5 ppm, except that swamp waters may have a low of 2.5 ppm.
7. Toxic wastes, deleterious substances, colored or other wastes, or heated liquids.	None alone or in combination with other substances or wastes in sufficient amounts or at such temperatures as to be injurious to fish life or make the waters unsafe or unsuitable for bathing.

CLASS B

Suitable for domestic supply after complete treatment in accordance with regulations of the State Board of Health. Suitable also for uses requiring water of lesser purity.

Quality Standards for Class B Waters

Items	*Specifications*
1. Floating solids; settleable solids; oil; sludge deposits.	None which are readily visible and attributable to sewage, industrial wastes or other wastes and which measurably increase the amounts of these constituents in receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.
2. Sewage or waste effluents.	None in such quantities or qualities as to make the Coliform bacteria count of the waters exceed 5000 per 100 ml.
3. pH.	Range between 6.0 and 8.0, except that swamp waters may range from pH 5.0 to pH 8.0.
4. Dissolved Oxygen.	Not less than 4.0 ppm, except that swamp waters may have a low of 2.5 ppm.
5. Phenolic compounds.	Not greater than 5 parts/billion.
6. Toxic wastes, deleterious substances, colored or other wastes, or heated liquids.	None alone or in combination with other substance or wastes in sufficient amounts or at such temperature as to be injurious to fish or make the waters unamenable to standard treatment processes intended to prepare them for domestic use.

CLASS C

Waters suitable for propagation of fish, industrial and agricultural uses and other uses requiring water of lesser quality.

Quality Standards for Class C Waters

Items	*Specifications*
1. Floating solids; settleable solids; oil; sludge deposits.	None which are readily visible and attributable to sewage, industrial wastes or other wastes and which measurably increase the amounts of these constituents in receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.

Items	*Specifications*
2. pH.	Range between 6.0 and 8.5, except that swamp waters may range between 5.0 and 8.5.
3. Dissolved Oxygen.	Not less than 4 ppm, except that swamp waters may have a low of 2.0 ppm.
4. Toxic wastes, deleterious substances, colored or other wastes, or heated liquids.	None alone or in combination with other substances or wastes in sufficient amounts or at such temperatures as to be injurious to fish life or impair the waters for any other best usage as determined by the Water Pollution Control Authority for the specific waters which are assigned to this class.

CLASS Ca

Waters suitable for fish survival*, industrial and agricultural uses and other uses requiring water of lesser quality.

Quality Standards for Class Ca Waters

1. Floating solids; settleable solids; oil; sludge deposits.	None which are readily visible and attributable to sewage, industrial wastes or other wastes and which measurably increase the amounts of these constituents in receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.
2. pH.	Range between 6.0 and 8.5, except that swamp waters may range between 5.0 and 8.5.
3. Dissolved Oxygen.	Not less than 2.0 ppm.
4. Toxic wastes, deleterious substances, colored or other wastes, or heated liquids.	None alone or in combination with other substances or wastes in sufficient amounts or at such temperatures as to be injurious to fish survival or impair the waters for any other best usage as determined by the Water Pollution Control Authority for the specific waters which are assigned to this class.

*"Fish survival", as used in this standard, means the continued existence of individual fish normally indigenous to waters of this type.

CLASS D

Temporary classification to be assigned waters receiving wastes for which no practicable means of treatment is known. Dischargers of wastes shall make every reasonable effort to avoid creation of nuisance conditions.

As soon as feasible treatment processes are available, Class D waters shall be reclassified to an appropriate class and further waste discharges governed accordingly.

RULES AND REGULATIONS OF THE SOUTH CAROLINA WATER POLLUTION CONTROL AUTHORITY

Promulgated under authority of Water Pollution Control Act of May 3, 1950

(Revised September 13, 1956)

1. Application for permits and plans and specifications for (1) new disposal systems (2) alterations or additions to existing disposal systems (3) placing such new or altered system in operation (4) increasing the load on any receiving stream by added discharge through an existing system, shall be submitted to the Combined Sanitary Engineering Division and Water Pollution Control Authority of the State Board of Health in accordance with existing regulations.

2. Public notice of all hearings set by the Authority shall be made by publication once each week for two consecutive weeks prior to the hearing date in a newspaper of general circulation in the county in which the waters under consideration are located. Where the waters under consideration are located in more than one county, then such hearing shall be held in the county selected by the Authority and such notice shall be published in a newspaper of general circulation in the area concerned. Where the matter under consideration is deemed by the Authority to be of State-wide significance, such public hearing shall be conducted at the place selected by the Authority and public notice thereof shall be published once each week for two consecutive weeks prior to the hearing date in daily newspapers of general circulation in the Cities of Charleston, Columbia, and Greenville, or such others as determined by the Authority.

3. Public hearing provided by the Water Pollution Control Act shall be conducted by a Hearing Examiner or Examiners, who shall be Members of the Authority or persons duly authorized by the Authority, in accordance with the Act. A record of the proceedings shall be taken, and a copy thereof, certified by the Hearing Examiner, shall be filed in the office of the Water Pollution Control Authority. All testimony shall be given under oath administered by the Hearing Examiner or any other competent and authorized party. All parties and persons interested may present printed, mimeographed or typewritten briefs, and may make oral arguments in the discretion of the Hearing Examiner.

4. The Hearing Examiner shall within 30 days after hearing make a report of his findings and recommendations to the Water Pollution Control Authority for disposition of the matter under consideration. The report shall be accompanied by a transcript of testimony taken, together with exhibits, and a summary of relevant information from and results of stream examinations conducted by the technical staff of the Authority. The Authority will within 30 days after receipt of the Hearing Examiner's report make such determination and order in the matter as is necessary, which order shall be filed for public record in the office of the Water Pollution Control Authority. Copies thereof shall be mailed upon request to all parties or persons interested, and a copy of such order shall be served, by registered mail or by personal service, upon all persons or parties sought to be bound thereby. Where public hearings are held in connection with a meeting of the Authority, or are conducted by the Authority as a whole, decisions thereon shall be rendered within 60 days from the date of hearing, and an order thereon shall be filed in accordance herewith.

5. Appeals from final orders of the Authority shall be made within 30 days from the date of the filing of such order, in accordance with Section 6 of the Water Pollution Control Act.

6. Any person or persons who shall desire a hearing or rehearing on any matter within the jurisdiction and control of the Water Pollution Control Authority, shall make a written request therefor directed to the Executive Director of the Authority, setting forth in concise form the specific questions

sought to be considered and the reasons for such hearing or re-hearing. Such requests shall be considered by the Authority at the next regular meeting following receipt of the request, and the Authority may in its sole discretion grant such hearing or re-hearing.

Promulgated October 20, 1950.

A REGULATION REQUIRING THE SUBMISSION OF ENGINEERING REPORTS AS A PART OF APPLICATIONS FOR THE DISCHARGE OF SEWAGE AN/OR INDUSTRIAL WASTES AND FOR THE CONSTRUCTION OR ALTERATION OF TREATMENT WORKS OR OUTLETS OR FOR THE INCREASE OF LOAD THROUGH EXISTING TREATMENT WORKS OR OUTLETS.

ADOPTED BY

THE SOUTH CAROLINA WATER POLLUTION CONTROL AUTHORITY

Under Authority of Section 70-108, Chapter 3, Title 70, Volume 6 of the 1952 Code of Laws of South Carolina

JANUARY 1, 1954

A regulation requiring the submission of engineering reports as a part of applications for the discharge of sewage and/or industrial wastes and for the construction or alteration of treatment works or outlets or for the increase of load through existing treatment works or outlets.

I. GENERAL

Under Title 70, Chapter 3, Water Pollution, Section 70-108, Volume 6 of the 1952 Code of Laws of South Carolina, the South Carolina Water Pollution Control Authority is authorized to adopt such rules and regulations as may be necessary to implement the Law.

II. DEFINITIONS

A. Person

"Person" means any individual, public or private corporation, political subdivision, government agency, municipality, industry, copartnership, association, firm, trust, estate or any other legal entity whatsoever.

B. Waters

"Waters" shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic Ocean

within the territorial limits of the State and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt, which are wholly or partially within or bordering the State or within its jurisdiction.

C. Marine District

"Marine District" shall include the waters of the Atlantic Ocean within three nautical miles from the coast line and all other tidal waters within the State.

D. Sewage

"Sewage" means the water-carried human or animal wastes from residences, building, industrial establishments or other places, together with such ground water infiltration and surface water as may be present and the admixture with sewage, as above defined, of industrial wastes or other wastes, as hereafter defined, shall also be considered "sewage".

E. Industrial Waste

"Industrial waste" means any liquid, gaseous, solid or other waste substance or a combination thereof resulting from any process of industry, manufacturing, trade or business or from the development of any natural resources.

F. Other Wastes

"Other wastes" means garbage, refuse, decayed wood, sawdust, shavings, bark, sand, clay, lime, cinders, ashes, offal, oil, tar, dye stuffs, acids, chemicals, dead animals and all other substances not sewage or industrial waste which may cause or tend to cause pollution of the waters of the State.

G. Pollution

"Pollution" means the discharge or deposit into the waters of the State of sewage, industrial waste or other wastes, or the effluent therefrom, in such manner, conditions or quantity as may cause such waters to be contaminated, unclean, noxious, odorous or impure to such extent as will or may contravene the standards of quality and purity established by the Authority for such waters.

H. Standard or Standards

"Standard" or "Standards" means such measure of purity or quality for any waters in relation to their reasonable and necessary use as may after hearing be established by the Authority pursuant to Sections 70-112 to 70-114 and Sections 70-125 to 70-129.

I. Authority

"Authority" means the Water Pollution Control Authority of South Carolina.

J. Sewage System or Sewerage System

"Sewage system" or "Sewerage system" means pipe lines of conduits, pumping stations, force mains and all other construction, devices and appliances appurtenant thereto used for conducting sewage, industrial waste or other wastes to a point of ultimate discharge.

K. Treatment Works

"Treatment works" means any plant, disposal field, lagoon, constructed drainage ditch or surface water intercepting ditch, incinerator, area devoted to sanitary land fills or other works not specifically mentioned herein, installed for the purpose of treating, neutralizing, stabilizing or disposing of sewage, industrial waste or other wastes.

L. Disposal System

"Disposal system" means a system for disposing of sewage, industrial waste or other wastes, including sewerage systems and treatment works.

M. Outlet

"Outlet" means the terminus of a sewer system or the point of emergence of any water-borne sewage, industrial waste or other wastes, or the effluent therefrom, into the waters of the State.

N. Shellfish

"Shellfish" includes oysters, scallops, clams, mussels and other aquatic mollusks and lobsters, shrimp, crawfish, crabs and other aquatic crustaceans.

III. REQUIREMENTS FOR THE SUBMISSION OF REPORTS

A. Who Shall Submit Reports

Any person intending to discharge sewage and/or industrial waste into the waters of the State where such wastes are not presently discharged; any person intending to increase the quantity of sewage and/or industrial wastes which are being discharged to such waters on the effective date of this Regulation; any person intending to construct a new outlet, or build, add to, or alter any treatment works for the handling of sewage and/or industrial wastes, shall, before starting such work, apply to the South Carolina Water Pollution Control Authority on the form provided for such application, and shall supply to the Authority a general Engineering Report describing the proposed work and its purpose and the steps which will be taken to control pollution of the waters of the State. Said report shall be prepared in accordance with the general rules which follow. No construction work shall be started until the report has been approved and a construction permit has been received from the Authority. All conditions under which such permit is issued, which are considered by the Authority to be reasonable and necessary, shall be stated in the permit. This regulation does not apply where the projects involved are under actual construction or alteration on the effective date of this order.

B. Professional Engineer Required

The information submitted in compliance with this Regulation shall be prepared by a person properly qualified to perform engineering work as provided in the South Carolina Code of Laws of 1952, Title 56, Chapter 12. The report shall be submitted to the South Carolina Water Pollution Control Authority, Columbia, South Carolina, and shall be signed by a professional engineer as defined by the above named Act. Said report shall be submitted at least thirty days before approval is desired.

C. Content of Engineer's Report

To comply with these regulations the report shall include the following:

1. A brief statement describing the proposed project.

2. A statement giving the location of the proposed sewage and/or industrial waste outfall, and either an adequate description of its exact location, or a map showing its location.

3. A statement giving the volume and concentration of sewage and/or industrial waste, as measured or as estimated by some reliable method, which is being or which will be discharged and the extent to which the volume and concentration will be affected by the proposed project.

4. An estimate of the extent to which the quality (expressed in terms of pounds B.O.D. per 24 hr.) of the waste will be improved by the proposed treatment works or by such other or additional steps as will be taken to control pollution.

The constituents of the waste which may influence its quality may include, but are not necessarily limited to the following:

a. Oil, floating and settleable solids.

b. Acids, alkalies, and dissolved salts.

c. Organic matter as measured by the test for bio-chemical oxygen demand, five-day B.O.D. at 20° C., as described in "Standard Methods for the Examination of Water and Sewage".

d. Toxic materials.

e. Compounds producing taste and odor in water or in the flesh of edible fish.

f. Colored materials and dyes.

5. A description of the treatment works which will be provided, including plans and specifications.

6. An estimate of the rate of low flow of the receiving stream.

7. An estimate of the extent to which the proposed discharge, whether treated or not, will alter or affect the quality of the receiving water.

8. Such other pertinent data as may be necessary for a good understanding of the proposal which is being made.

9. Nothing herein contained, however, shall require the owner of any industrial or municipal establishment to disclose any classified data of the Federal Government or any confidential information relating to secret processes or economics of operation.

IV. THESE REGULATIONS SHALL TAKE EFFECT JANUARY 1, 1954.

I certify that the foregoing regulation was approved by the South Carolina Water Pollution Control Authority during December, 1953; and I further certify that said regulation is herewith filed with the Secretary of State and with the South Carolina Code Commissioner on this day, December 15, 1953, under authority of Section 70-115, Chapter 3, Title 70, Volume 6 of the 1952 Code of Laws of South Carolina.

W. T. Linton L. S.
Executive Director
S. C. Water Pollution Control Authority

Senator JOHNSTON. The next witness is E. V. Lewis, manager, Central Electric Power Cooperative, Inc.

STATEMENT OF E. V. LEWIS, MANAGER, CENTRAL ELECTRIC POWER COOPERATIVE, INC.

Mr. LEWIS. Senator Johnston, Mr. Chairman, and members of the committee, my name is E. V. Lewis, and I am manager of the Central Electric Power Cooperative, Inc., an electric transmission cooperative.

Sixteen of the 23 rural electric power systems in South Carolina are members of the Central Cooperative which supplies all of the wholesale power requirements for their 85,000 rural South Carolina inhabitants.

The CHAIRMAN. How many families does that represent?

Mr. LEWIS. That is 85,000 families.

The CHAIRMAN. I see.

Mr. LEWIS. We conservatively figure four to a family. We would actually touch four times as many people.

Mr. Chairman, I am not an expert on water resources. I am only a farm boy and what I know about this matter was gained as I grew up on the farm and since that time the 20 years that I have spent as manager of a rural electric cooperative in attempting to obtain an economic and dependable source of electric energy for our rural people.

First, I want to thank you gentlemen for taking the time to come to South Carolina and hold this hearing. South Carolina is a small State but we are vitally interested in the conservation of our natural resources and especially are we interested in the conservation of our water resources.

Progress in America can be critically retarded unless immediate steps are taken to meet the ever-increasing demands for clean water and reliable electric power. The two are very closely related, for electric power cannot be produced without water to cool giant new steam electric generating stations or stored for hydroelectric power.

The Department of Commerce estimates that public use of water will increase by some 65 percent by 1975. Within two decades we must find 42 percent more water for irrigation, and the use of water for industrial processing and for steam electric power generation will increase more than 100 percent.

With all this increased need for water, water tables are falling, wells are dry and restrictions have been put on the use of water in many areas. But while some areas suffer from drought and water shortages, others are plagued by periodic floods that have cost the American people some $5 billion over the past 10 years. Mr. Chairman, I understand that figure is probably larger than we have put into all of your large dams on our great river systems.

The CHAIRMAN. Correct.

Mr. LEWIS. Flood control and power production are not only compatible, they are inseparable if our water resources are to be used to the maximum potentials.

It has been said that the South Carolina river system dumps more water in the ocean than that of any other State on the eastern seaboard. It is our responsibility—the responsibility of all our citizens—to

carry the conservation movement forward, to increase our knowledge and understanding of problems and solutions. A large percentage of our water today runs to waste, unused for irrigation or the generation of power, burdened with precious topsoil from our eroding lands.

As long as floods kill and destroy, as long as the rivers flow silt-laden to the sea; as long as penny wise, pound foolish men pollute the rivers or allow selfish interests to control them; as long as one kilowatt of hydropower runs wasted to the sea, there is work to be done.

We agree with Theodore Roosevelt that—

> every stream should be used to its utmost. No stream can be so used unless such use is planned in advance. When such plans are made, we shall find that, instead of interfering, one use can often be made to assist another. Each river system, from its headwaters in the forest to its mouth on the coast, is a single unit and should be treated as such.

The Rural Electric Cooperative people of the State of South Carolina hope and trust that these hearings which you gentlemen are holding will result in an immediate decision of our Government to do whatever is necessary to carry out a planned program of conservation of all our natural resources throughout this great country of ours. Thank you, sir.

The CHAIRMAN. Just a minute, Mr. Lewis. I want to thank you. I gathered from what you said here that there is some damage from uncontrolled floods occasionally in this area.

Mr. LEWIS. Yes, sir; still is, sir.

The CHAIRMAN. You have it here?

Mr. LEWIS. We had it this year, sir.

The CHAIRMAN. Thank you.

Senator JOHNSTON. Hon. R. M. Jefferies, who is general manager of the South Carolina Public Service Authority, from Moncks Corner, S.C. He is the former Governor of South Carolina, too.

The CHAIRMAN. Governor, we are honored to have you here.

Mr. JEFFERIES. Thank you, sir.

I am going to adhere to my prepared statement because I think it will save your time.

The CHAIRMAN. All right.

STATEMENT OF FORMER GOVERNOR R. M. JEFFERIES, GENERAL MANAGER, SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

Mr. JEFFERIES. We get started on a subject that I have been so much interested in that if I would get extemporaneous I might keep you here all afternoon.

Let me first welcome to South Carolina the distinguished U.S. Senators composing the Senate Select Committee on National Water Resources.

Our State has a definite stake in the conservation of all natural resources but particularly water. It is therefore most gratifying to us that such outstanding Members of the U.S. Senate have honored our State by their presence today for a discussion of this all-important topic.

Solely for purposes of identification, my name is Richard M. Jefferies. I am a lawyer and have held numerous public positions in the State. I served in the South Carolina State Senate for 32 years and,

as president pro tempore of that body, I was permitted to fill out the unexpired term of Gov. Burnet R. Maybank when he entered the U.S. Senate.

I have been connected with the South Carolina Public Service Authority from its very beginning and was privileged to assist in planning and writing the legislation which made it possible. Later as general counsel, I conducted for the State the defensive litigation which delayed the building of the project for several years after the legislature had authorized it. I have served in the position of general manager for the authority since 1943 and prior to that time headed its legal division.

Mr. Chairman, I do not think he wishes to make a statement but we have here the Honorable James H. Hammond who is chairman of the board of directors. I will ask Mr. Hammond to stand.

The CHAIRMAN. Mr. Hammond, glad to see you, sir.

Mr. JEFFERIES. Another director, Mr. Thy, has just been called out. Also from our authority our manager of general maintenance, Mr. Carl Walsh is present. Will you stand, Mr. Walsh.

South Carolina Public Service Authority was established as an agency of State government by act of the South Carolina Legislature in 1934 for the purpose of developing the Cooper, Santee, Congaree, and Wateree Rivers for navigation and hydroelectric generation. At the time that the authority was established, private companies had been unsuccessful in financing the work on account of the great depression in the early 1930's. During the national program for the relief of unemployment our authority applied for loans and grants with which to build the project and these were approved by the President of the United States and the Public Works Administration in 1935.

This dam, if you are looking at your map, is below Columbia near Charleston. The status today is that by building a diversion dam on the Santee River, sending most of the Santee River water through canals and lakes into the Cooper River, there is a navigation channel with a minimum 10-foot depth leading from Charleston to the confluence of the Congaree and Wateree Rivers.

The CHAIRMAN. The Congaree and what?

Mr. JEFFERIES. The Wateree Rivers. They come together about 50 miles below Columbia.

The CHAIRMAN. In other words, that is above Lake Marion?

Mr. JEFFERIES. Lake Marion is one of our lakes; yes, sir. Incidentally, that is probably the only hydroelectric development in a coastal plain below the fall line anywhere in the world. This is just 30 miles from the Atlantic Ocean. The powerplant is on the line. There are dams maybe like this in Brazil where the mountains go down to the sea right near the ocean. But it was unheard of in this State. It is not in the statement since you asked the question. It was unheard of in this area for a dam to be built in a flat coastal plain. The reason for it and what gave the fall was that the Santee River was elevated above the Cooper River 32 feet and the Cooper River headwaters came within about 4 miles of the Santee, hence dam up the Santee, divert it through a canal into the Cooper made almost an artificial reservoir on your map as Lake Moultrie and put the powerplant there and we have a very fine, efficient hydroelectric de-

velopment within 30 miles of the open ocean in the coastal plain 75 or 80 miles below the fall line. The fall line is right here at Columbia.

Senator JOHNSTON. I well recall the background there for I was Governor at the time that the Public Works Administration approved it in 1935.

Mr. JEFFERIES. That is right.

Senator JOHNSTON. Of course you had all kinds of complaints about what would happen down there and had goldfish holes and water would run under the dam and couldn't hold the water, and everything else in regard to it at the time, if you recall.

Mr. JEFFERIES. Senator Johnston has been most helpful to the project from its very inception, and in the Governor's office he was particularly so. We are blessed that he has maintained that interest in the U.S. Senate. A brother of Senator Johnston rendered distinguished service as a member of our board of directors for a period of 7 years.

I am back on page 2. There is a navigation channel with a minimum 10-foot depth leading from Charleston to the confluence of the Congaree and Wateree Rivers, a distance of about 115 miles, most of which is slack water. We have installed in our hydroelectric generating station near Moncks Corner, S.C., five turbines and generators with a nameplate capacity of about 132,000 kilowatts.

We have also built a small generating station at the spillway on the Santee River to generate electricity from the 500 cubic feet per second which we must discharge at all times down the Santee River. We have also built at our hydrostation an auxiliary steam electric generating station of a capability of nearly 100,000 kilowatts. We entered into an agreement with the Central Electric Power Cooperative, Inc., Mr. Lewis, who has just testified being the manager of that concern, composed of 16 rural electric cooperatives for the construction with REA financing of a transmission system into 34 South Carolina counties and these cooperatives are now securing their electric energy from us. We also serve some municipalities and some large and small industries, as well as distribution plants in Berkeley, Georgetown, and Horry Counties. Those are coastal counties on the map you are referring to.

Senator JOHNSTON. What are you charging at the present time per kilowatt-hour for REA?

Mr. JEFFERIES. The REA rate at the present is printed on page 6, and is 4 mills per kilowatt-hour.

The CHAIRMAN. Is that at your busbar or at their receiving station?

Mr. JEFFERIES. On the high side of their receiving station.

Senator JOHNSTON. I think we ought to have that put into the record to show what you mean to the rural electric co-ops at the present time, the rate they are receiving. As I understand it, in New York State they are charging them about 11.2. As you go on up, the further you get away from down where you have some power companies that belong to the Government you will find that up in Maine they charge about 15.2. I think I ought to bring that out.

Mr. JEFFERIES. In addition to our generating facilities, we have entered into a contract with the Southeastern Power Administration to buy from the Clark Hill project on the Savannah River a large portion of the power from that plant allocated to South Carolina.

In view of our duties under South Carolina law to provide electric power and energy and navigable channels, we are deeply interested in everything for the conservation of the water resources of the State. Our State is blessed with many large streams affording the finest type of industrial water, navigation channels and hydroelectric water supply. There are three major river basins, all interstate, to wit: The Savannah River between South Carolina and Georgia; the Pee Dee-Waccamaw River system rising in North Carolina where the Pee Dee is known as the Yadkin; and the Santee River system with its tributaries rising in the mountains of western North Carolina. The Pee Dee-Waccamaw system is the second largest stream in the United States emptying into the Atlantic Ocean, with the Santee being the third largest. In addition to the major river systems and their various tributaries, there are several other smaller streams like the Edisto and the Black Rivers, and maybe a dozen even smaller.

With a navigation channel of 10 feet and above in depth going from Charleston to within 50 miles of Columbia, the challenge to our people is to complete the navigation channel all the way to Columbia on the Congaree River and to Camden on the Wateree River, for which purpose a legislative and gubernatorial committee is now at work and the Army Engineers are conducting a new study. The U.S. Senate can be of great assistance in making all of these efforts successful.

With an average statewide rainfall of between 47 and 48 inches per year and heavier in the mountainous areas and with magnificent river systems, we have available a large supply of industrial water unexcelled anywhere in the Nation.

In November of 1959 we took samples of the water from points about 30 miles below Columbia to our powerhouse which were analyzed by the Parker Laboratory, consulting chemists, of Charleston. The remarks on the report from the laboratory are as follows:

> **The chemical analysis indicates that the samples represent a good source of raw water for general industrial and household use. The salinity or salt content is very low and the hardness is slightly greater than 1 grain (18–20 parts per million) indicating that the water is soft. The only corrective treatment required to improve this raw supply would be coagulation and filtration to remove the color and iron and chlorination to provide a safe water to drink.**

That water is so soft when we first constructed the dams we had some 40-odd miles of dams and in addition we protected the slopes with the porous concrete covering recommended by the engineers. After 2 or 3 years that gave way and the consulting engineers, one of them in particular, said the reason that concrete apron gave way was that the water was so soft it was really lime hungry and the continual flowing of the water in and out of that porous concrete protection caused it to disintegrate. It was really about as soft water as you can find anywhere in the world and thank God it is not polluted yet. We will get to that a little later.

Our first appeal to this committee is for the passage of proper legislation to protect such fine waters from pollution insofar as the waters are interstate in character. South Carolina is doing a magnificent job in protecting the intrastate waters from pollution, but since all of our major streams flow from other States some national legislation may be necessary but the same should not in any way supersede or restrict the fine work we are doing in this respect.

South Carolina has done much preliminary work in preparation for better water control laws, probably to be modeled somewhat on the water appropriation laws of many Western States. Up to the present time the legislature has not passed such laws, largely because with such an abundance of fresh water the people have not fully realized the need for such legislation. Let me urge the special committee from the U.S. Senate not to recommend the passage of a national water appropriation law or any legislation which would interfere with the rights of the States for water use regulation. I had the honor of serving on that water policy committee for several years and we were disappointed that we have been unable to get the legislature to see the wisdom of passing a proper water control law. It is still a live subject, though, in the State and committees are still working. Mr. Lyton of the pollution authority is now heading up an investigation again.

Senator JOHNSTON. But do you not believe, as I do, that they will see the light very soon and do something in that field?

Mr. JEFFERIES. No doubt about it. The help that the Federal Government could give is where a stream or river runs through more than one State. Now, that might be arrived at by compact, as was suggested a few minutes ago, between the States, but I am afraid it would be ineffective.

The CHAIRMAN. The compact is a fine thing. It sets up and fixes certain rights. But suppose you had a compact with a neighboring State under the terms of which you agreed not to pollute any of their water and they agreed not to pollute any of your water and one of the other States did not live up to it.

Mr. JEFFERIES. That is right. In addition, the interests of the two States often vary. They have different standards, and a national water pollution law, a strong one, applying only to interstate streams and imposing rather rigid standards, would be of tremendous advantage in conserving the national supply of fresh water.

The CHAIRMAN. It might be of some interest to you to know you are talking to a committee the members of which are as much interested in the preservation of State rights as any witness that has ever been before us.

Mr. JEFFERIES. Good. I touch on that at the end of my statement here. I could not refrain from doing it. I do touch on it toward the end.

Let me finish that paragraph. The next to the bottom one.

One of the great disadvantages attending our fine river systems is the fact that they are susceptible to floods and to droughts. Prior to 1958 we had a drought lasting practically 7 years in which the streamflow in the Santee River went as low as 710 cubic feet per second on October 17, 1954, as compared with a 34-year average of 18,619 cubic feet per second.

The drought was relieved and by 1959 several floods occurred. The first 4 months of 1960 have been extremely wet. In 1959 through our spillway we wasted water totaling 396,897,666,800 gallons with which, if we could have contained it, we could have generated 71,470,505 kilowatt-hours worth, at the price of fuel for steam generation, a min-

imum of $264,000, but which at prevailing power rated in the State would have been worth nearly double that amount.

During the first 4 months of 1960 we have spilled water a total of 87 days, there being only 180 days in the first 4 months—we spilled it 87 days—the amount being 1,144 billion gallons. This water which we spilled in the first 4 months of 1960 would have generated, if it could have been put through our turbines, a total of approximately 199 million kilowatt-hours, which at the price of fuel would have been worth $735,000 but which at the average price of power in South Carolina would have been valued at more than a million dollars. These wasted gallonage figures sound like the Federal budget sums. When we talk in billions in South Carolina we have to look at the Federal budget to know what it means.

The great economic waste from an electric generating standpoint can be prevented by flood prevention facilities all the way up to the source of the streams, which facilities in addition to assisting with hydroelectric generation would greatly retard floods, prevent agricultural and industrial damage, and conserve the water for use during periods of drought. These facilities should be in the nature of small flood control dams in the three States from which waters flow through our rivers, to wit: North Carolina, South Carolina, and Georgia. Since the streams are interstate in character, flood prevention and control is a proper function of the Federal Government but all facilities constructed should be controlled by the States concerned.

These flood prevention facilities should not be construed as high dams for the generation of hydroelectric energy because high dams could not serve the purpose of numerous small dams scattered over the entire watershed. Also, the high dams are extremely expensive and any electric energy which can be generated might not be economically justified.

It is a fiction in South Carolina to believe that Federal dams generate cheap electric power. The rates charged for firm power by the Southeastern Power Administration are higher than the costs of the same amount of energy generated by steam. We speak with knowledge there as we have a contract with them for 70,000 kilowatts of power at an average of more than 6½ mills. We use it, of course, for peaking but we could not afford to buy it. That is compared with a rate the co-ops are now paying us of 6.4; if we had to supply them out of the Federal dam on the Savannah River we would, of course, lose a good deal of money on it.

Mr. CHAIRMAN. Is it possible that if you did not have access to that source of power for peaking power that you could acquire peaking power for a less amount somewhere else?

Mr. JEFFERIES. The only other recourse would be steam generation.

The CHAIRMAN. That would have to be of your own building, would it not?

Mr. JEFFERIES. Yes.

The CHAIRMAN. Can you build generating capacity to provide peaking power at a rate less than that?

Mr. JEFFERIES. We have postponed the construction, although we have a steam auxiliary and we need another one, but we have postponed that on account of the prevailing tight money policies over the whole Nation. We do not care to finance in the present market.

Hence we have increased our purchased power from the Federal dam on the Savannah and we have worked out a very satisfactory arrangement with South Carolina Electric & Gas Co. whereby we can get additional supplies from them. They have several new efficient steam generating stations.

The CHAIRMAN. What rate do you get from them?

Mr. JEFFERIES. It is a little higher. I think it will average a little over 7 mills but it is still peaking power.

The CHAIRMAN. All right.

Mr. JEFFERIES. Some of the things making high priced power at Federal dams are the exessively high costs of construction, the charging of too much of the costs to power generation and not enough to navigation, flood control, and recreation, and the bureaucratic maze attending its generation and sale. Some of those things could be relieved by additional acts of the Congress. Right now the power is practically carrying the whole burden. There is some allocated to flood control, some percentages to that, and some to navigation.

The CHAIRMAN. There is a great battle going on in Congress now and in my judgment it will continue until it is won by people who are just as much opposed to the charging of power rates to pay for more of a reservoir than is allocable to power generation as there is being carried on in connection with that little matter you mentioned about interest rates.

Mr. JEFFERIES. Yes, sir.

The CHAIRMAN. Those matters will have to be fought out up there but I am glad you are calling their attention to their relationship to the water problems at the local level.

Senator JOHNSTON. Right on that subject, if you will recall several years ago, Mr. Jefferies, at least 10 years ago, that I introduced on the floor of the Senate an amendment to mark off the Santee-Cooper the parts that were used for flood control and not charge that to you. It ran into millions of dollars. Also to reduce your interest rate. They compromised with me on the floor of the Senate and reduced your interest rate but would not take the other part of my amendment.

Mr. JEFFERIES. That is correct.

The result of that very thing, our hydroelectric costs in round figures come to $65 million. There are fully $10 million of those costs to be allocated to navigation alone. Then, when you were to allocate additional money to flood control below the dam, it would run into probably $20 million more because of the power having to carry the whole freight. Our financing is entirely by revenue bonds. We must pay them. The State does not levy any tax. The act says the State will never levy a tax to pay them; hence, the power is carrying all the other payments. There is no doubt about that. It has proved rather hard at times. Then on top of that, with all that extra cost, the Federal Power Commission, in the proceeding that we brought to be exempted from annual charges on the ground of being a navigation project, held we were not a navigation project although our cost had been greatly increased by reason of the navigation features.

The CHAIRMAN. All right.

Mr. JEFFERIES. As a matter of fact, the Congress could well pass legislation turning over to the States concerned the operation of all Federal dams subject only to regulation from the Army Engineers

for the discharge of water for navigation and other purposes below the dams. In turn, the States should operate the dams through public bodies, cooperatives, or by arrangement with private power companies with the ever-present hope that such operation would result in generating cheap electric power which the Federal Government has failed to do in the Southeast.

Therefore, for water conservation, flood control, the generation of hydroelectric energy, navigation, and industrial water uses, a program of small dams through the watersheds should be instituted at once through appropriate Federal legislation but in full cooperation with the States concerned. These dams would have many values, important among which is recreation. It has often been said that the recreational values of the Santee-Cooper lakes would justify their construction. Likewise, in recreational work which is also a national problem, the water conservation facilities would be of great benefit.

It is therefore my position that the waters of this State should be protected by strong antipollution measures and should be conserved for hydroelectric generation, flood control, navigation, industrial water uses, and recreation by facilities furnished by the Federal Government in cooperation with the States.

In any legislation which may be passed, let me strongly recommend that nothing be done to interfere with the rights of the States or which would permit Federal control and domination. The national problems of the United States can never be solved fully and completely until we return to the principles of those who first made the Nation of protecting the rights of the individual States. Of course, there were States before there was a Nation known as the United States. For the United States to prosper and achieve its mission in the world, we must return to fundamentals and realize that the Federal Government has limited powers and that all powers not specifically given by the Constitution of the United States are reserved to the States and the people.

I appreciate very much the opportunity of having been permitted to make this statement.

Senator JOHNSTON. It was certainly nice to have had you.

Mr. James H. Hammond.

STATEMENT OF JAMES H. HAMMOND, CHAIRMAN OF THE BOARD, SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

Mr. HAMMOND. Governor, I appreciate being asked to say something but there is only one thing I could suggest and I would like to, if I could get our gentlemen from over on the Savannah River, to go down below Augusta. I own land there on the Eddystone and the Savannah and I would like to amplify his statement and maybe carry him down there sometime in my car and show him something. I had several hundred acres of land down there and up to 100 years ago my family used to farm it. It had not been farmed in 40 or 50 years on account of the floods until Clark Hill was built. We are starting to farm it again.

The CHAIRMAN. You mean that there is some flood control value to Clark Hill?

Mr. HAMMOND. Yes, sir. The flood control will bring the land back into cultivation.

The CHAIRMAN. How much land did that apply to?

Mr. HAMMOND. I beg pardon, sir?

The CHAIRMAN. How much land?

Mr. HAMMOND. I only have about 700 acres of land.

The CHAIRMAN. No, I mean generally.

Mr. HAMMOND. The whole country down there is affected. I am just talking about my own.

The CHAIRMAN. Is as much country affected as is inundated or more?

Mr. HAMMOND. Since Clark Hill has been built where they used to have the floods, they do not have them.

The CHAIRMAN. I think that is very interesting information.

If you could advise the reporter, I would like for you to tell him the scope of land now being protected.

Mr. HAMMOND. I would not be able to tell you all of that. I live here, you know. But——

Senator JOHNSTON. Knowing Jim as I do, he would want to be exact but I think probably if you give him the right he could get it later and put it into the record.

Mr. HAMMOND. Maybe I could.

The CHAIRMAN. Give us your best estimate for the record, if not now, later.

Mr. HAMMOND. Yes, sir.

The CHAIRMAN. Will you do that?

Mr. HAMMOND. I will do the best I can.

The CHAIRMAN. Thank you.

Mr. HAMMOND. Thank you.

The CHAIRMAN. That is all any of us are accustomed to doing.

Mr. HAMMOND. I might add this, though, the Chamber of Commerce of Augusta persuaded me to deed them about 60 acres of it for $1 and I found out later that I made a good trade.

(The following letter was subsequently received for insertion in the record:)

U.S. ARMY ENGINEER DISTRICT, SAVANNAH,
CORPS OF ENGINEERS,
Savannah, Ga., May 20, 1960.

Hon. JAMES H. HAMMOND,
Columbia, S.C.

DEAR SENATOR HAMMOND: In accordance with request of General Albrecht, I wish to inform you that the estimated annual flood control benefits derived from the Clark Hill project amount to $185,000.

The largest benefit derived during any one storm was that of March 4, 1952, in which the stage at Augusta was reduced from 33 feet to 23 feet, giving an estimated benefit of $230,000.

I hope that this information will serve your immediate needs. If additional data are needed, I will be pleased to furnish it.

Sincerely yours,

W. A. STEVENS,
Colonel, CE, District Engineer, Savannah District.

Senator JOHNSTON. Mr. Lewis E. Hendricks, Columbia, S. C., South Carolina Soil Conservation Committee.

STATEMENT OF LEWIS E. HENDRICKS, SOUTH CAROLINA SOIL CONSERVATION COMMITTEE; AND W. E. DARGAN, PRESIDENT, STATE ASSOCIATION OF SOIL CONSERVATION SUPERVISORS

Mr. HENDRICKS. Mr. Chairman, Senator Johnston, and distinguished committee; it is my privilege to make a brief statement on behalf of the South Carolina Soil Conservation Committee and the South Carolina Association of Soil Conservation District Supervisors.

The State of South Carolina is completely covered by 45 soil conservation districts. All of these districts are united through the South Carolina Association of Soil Conservation District Supervisors. The South Carolina State Soil Conservation Committee administers the South Carolina soil conservation district law in the State and provides leadership and coordination to the soil conservation district's program in the State.

Our statement is based primarily on the South Carolina portion of a recent national inventory of soil and water conservation needs and our firm belief that the small watershed approach as provided for by Public Law 566 is a vital approach toward solving our water problems and helping to provide water needed in future years. The Soil Conservation Service and numerous other agencies and organizations have worked together to complete early this year the South Carolina Inventory of Soil and Water Conservation Needs as a part of the national inventory. That inventory was made county by county to cover the whole Nation. A summary of watershed conservation that will be needed by the year 1975 as determined by this committee follows:

1. Total watersheds inventoried number 197. For inventory purposes, the State was divided into 197 watershed areas of a size and type normally suitable for watershed conservation and works of improvement.

2. Number of watersheds needing protection and flood prevention is 166.

3. The inventory determined that the acres subject to flooding was 1,235,477.

The CHAIRMAN. In South Carolina?

Mr. HENDRICKS. In South Carolina.

By 1975 flood prevention protection, that is not available now, it will be needed on that acreage.

4. Acres needing project action as provided for under Public Laws 566: 575,887.

5. Number of farms involved where project section will be needed is 25,432, or more than one-fifth of all farms in South Carolina.

6. Number of acres having drainage problems, 6,848,571, of this amount, the Soil Conservation Service estimates that 800,000 acres have been adequately drained up to this time.

7. Acres needing drainage as provided for under Public Law 566: 786,900.

8. Number of farms involved where drainage will be needed under Public Law 566: 20, 830.

9. Acres having an irrigation problem, 896,572.

10. Acres having an irrigation problem as provided for under Public Law 566 or that acreage that will need some group action to make irrigation facilities available, 281,885.

11. Number of farms involved where irrigation will be needed under Public Law 566 is 15,923.

12. Number of additional surface acres of water needed for recreational development, 14,237.

13. The estimated number of people who will benefit from this additional recreational water development, 414,625, or about one-fifth of the people in South Carolina.

14. Number of farms needing additional water for commercial size herds of livestock and for commercial poultry flocks, 11,802.

15. Number of people who will need additional water for domestic use, 238,464.

The inventory of soil and water conservation needs shows a big job remains to be done in South Carolina in conservation of natural resources. Soil and water affect the lives of all of our citizens.

In the element of water conservation, everybody depends on water but farmers are custodians of our watersheds.

Without water the wheels of most of our industry would stop. International Paper Co. at Georgetown, S.C., was threatened with such a stoppage in 1954. The company constructed 17 miles of canals, dikes, and pipelines to bring water from the Pee Dee River to their paper mill at Georgetown. The pipeline used is 4 feet in diameter. The canal crosses under two main highways. It required 4 side spillways for overflow, 17 traffic bridges, plus a flume to carry water over a creek.

West Virginia Pulp & Paper Co. uses 47 million gallons of fresh water per day. This is almost three times the amount used by the city of Charleston, S.C.

The Bowaters Corp. uses from 18 to 20 million gallons of filtered water per day at their Catawba plant. Plans have recently been announced to build a $60 million expansion to this plant. This will greatly increase the amount of water needed, for that plant.

Another example, the Celanese plant at Rock Hill, S.C., uses 12 times the amount of water daily as does the city of Rock Hill, 3 times the amount used by Charlotte, N.C. They use 28 million gallons a day in winter and up to 56 million gallons a day in summer where shortages are likely.

Cities require large quantities of pure water. As our cities grow, their water needs increase. Spartanburg, S.C., is a good example. In 1921, the normal plant capacity of the Spartanburg waterworks was 3 million gallons a day, and this was sufficient to meet all needs. In 1953, it was 9 million gallons, but was expanded during the year to 12 million. Their second large water storage reservoir was recently completed and put into use in 1960. This lake stores 9 billion gallons or 27,620 acre-feet of water.

Senator JOHNSTON. I would like to call your attention to that increase in 1953 in Spartanburg from 9 million to 12 million gallons. The war helped bring that emergency into effect. They furnished the water for Camp Crowder and they had to have it. When you developed this surplus water you also are getting water to take care of us in time of war.

Mr. HENDRICKS. Yes, sir.

A large city in this State has recently expanded its source at an estimated cost of about $81 per acre-foot of reservoir supply.

This trend to the use of more and more water by cities is characteristic of almost every municipality in South Carolina. The four cities of Charleston, Columbia, Greenville, and Spartanburg use a total of about 70 million gallons of water per day.

Another example in the vast need for water is irrigation requiring large amounts of water. Ray Prince of Inman, S.C. has an irrigation pump with a capacity of about 500 gallons per minute. He uses this system to irrigate 75 acres of peaches. If operated continuously, this would amount to about 700,000 gallons in a 24-hour period. This is about as much water as is used by the city of Chester, S.C. on an average day where there are 3 cotton mills and about 7,900 people.

Senator SCHOEPPEL. Have you experienced in your area a drawdown in your water tables from your irrigation or do you have enough of it? Have you tested it?

Mr. HENDRICKS. Sir, I doubt if we have enough reliable information to determine that very closely. We are just beginning to use irrigation to any extent in the State. I have a few more examples here that I will give on that. But during the last 3 or 4 years our rainfall has been above the normal. During a period in the early 1950's on up to 1957 we experienced an era where many of our wells dried up in the Piedmont area and our water table did drop quite a bit from just general observation.

The CHAIRMAN. That was during the drought of the 1950's?

Mr. HENDRICKS. Yes, sir, that is right.

The CHAIRMAN. Pardon me, Senator.

Mr. HENDRICKS. Another example of peach irrigation, Mr. L. D. Holmes of Johnston, S.C., has one irrigation pump which puts out 1,300 gallons of water per minute. If operated continuously, this pump would put out more than twice as much water in a 24-hour period as used by the city of Chester. In other words, it is just about twice the size of the pump of Mr. Prince at Inman.

There are in the State 51,576 acres of commercial peach orchards. The trend is toward irrigation of all peaches produced. That may well be the case by 1980. Figuring one-half foot of water per acre of peaches irrigated, it would require 25,788 acre-feet of water to irrigate our present acreage of peaches in this State.

In addition to use of water on peaches, irrigation is becoming increasingly popular on tobacco, truck crops, annual grazing, and some other crops in South Carolina.

Senator SCHOEPPEL. I hope you do not raise too much wheat down in this country.

Mr. HENDRICKS. No, sir, we are not a big factor in wheat production, although we have a very good yield of wheat in some sections of our State.

The growing demands for water in South Carolina have created widespread interest in water management through small watershed programs. Farmers are the first custodians of the water that falls in these watersheds. Under Public Law 566, local soil conservation districts are sponsoring projects or organized group action for watershed protection and flood prevention.

The CHAIRMAN. I would like to interrupt you there just one minute. You know Public Law 566 was amended by Public Law 1018, which really made it the great magna carta for watershed protection that it is?

Mr. HENDRICKS. Yes, sir.

The CHAIRMAN. Since I had quite a little to do in writing Public Law 1018, it is just a matter of personal pride that the amendment be mentioned in referring to it.

Mr. HENDRICKS. Yes, sir, I am aware, that it was amended and in my general reference to it I would include the amendment also, Public Law 1018.

The CHAIRMAN. All right.

Mr. HENDRICKS. I am right familiar with some of your work in Oklahoma on watersheds and the Sandstone Creek project, under Mr. Nalls.

The CHAIRMAN. That was under the 1944 legislation.

Mr. HENDRICKS. Yes, sir, that was under earlier authorization but it is carried out very much the same as the Public Law 566 plan.

The CHAIRMAN. That is right, same objective.

Senator JOHNSTON. I believe only last week we approved a nice little appropriation for the watersheds in South Carolina. I guess you realize that?

Mr. HENDRICKS. I am not too familiar with those yet.

Senator JOHNSTON. It has been through the House and last week the Senate passed it out of the Agriculture Committee, of which I am a member.

Mr. HENDRICKS. Good.

We consider that more emphasis should be given to flood prevention rather than curing of the damages from floods downstream. The Federal funds being used for flood prevention at the current rate are considerably out of balance. A major portion of these funds should be for prevention rather than downstream control of floods after they have occurred.

We would like to see the appropriations for Public Law 566 watershed and flood prevention increased and work under this program speeded up.

Research needs for soil and water conservation should be adequately provided in the interest of full beneficial use of our water resources. After lengthy study and discussion, the Agricultural Research Service of the U.S. Department of Agriculture, about a year ago, agreed on a comprehensive research program in this field with specific facilities and at specified locations. These should be provided in a package program.

Senator SCHOEPPEL. What is your concept of a package program now on that?

Mr. HENDRICKS. Sir, I understand that they finally agreed that across the country facilities that were needed to balance the work over the country would be a package deal. In other words, they had in their recommendations about 15 facilities that would bring the whole country up to a certain level of research in soil and water conservation. I understand that the House committee recently, and I do not know what the Senate committee has done on it, picked out four of those to recommend for appropriations for this year. They did not

pick them out according to the recommendations by the Department, or the research service. They skipped about over them. I believe your section of the country kind of out-politics us a little bit on those sometime.

Anyway, we think that they should be given equal consideration all over the country.

While we are mindful of the need to closely watch the level of expenditures for Federal projects, we believe the necessary funds for all of these facilities would be a use that would pay rich dividends in helping to solve some of the water resource problems that will be more intense as the years pass.

The growing competition for water in the Eastern States has focused attention on the question of water rights. A number of States of this area are now in the process of strengthening their water policies and water rights legislation. Some of those have been referred to by previous witnesses.

We favor the essence of legislation such as contained in the recently proposed Senate bill S. 1416 to clearly define Federal-State relations in the field of water rights. Thank you, sir.

The CHAIRMAN. Thank you, Mr. Hendricks.

Senator JOHNSTON. I have a telegram here from Robert W. Hemphill, Member of Congress. He says (reading):

Please express to Senator Kerr and others of your committee, my appreciation for their presence in Columbia today and the fine work they are doing in holding hearings on water and soil conservation. I have long sponsored moves to appreciate, conserve, and use the wonderful water resources of South Carolina and of this Nation, and our soil conservation service continues to be one of the best programs of our Department of Agriculture.

I regret I cannot be present to appear before the committee in person. Highest regards.

ROBERT W. HEMPHILL,
Member of Congress.

The next witness is W. E. Dargan of Darlington, S.C., president of the State Association of Soil Conservation Supervisors.

Mr. HENDRICKS. Senator, the statement I made was a joint one for Mr. Dargan and the State Committee.

The CHAIRMAN. Fine. We appreciate that.

Mr. W. B. McGuire, president, Duke Power Co., Charlotte, N.C.

STATEMENT OF JOHN D. HICKS, ASSISTANT GENERAL COUNSEL, DUKE POWER CO.

Mr. HICKS. Mr. Chairman and members of the committee, and Senator Johnston, as I reported to Senator Johnston on my arrival this morning, Mr. McGuire could not be here. I am John D. Hicks, assistant general counsel of Duke Power co. Mr. McGuire asked that I ask your permission for me to present his statement to you.

The CHAIRMAN. All right, Mr. Hicks.

Mr. HICKS. I do not wish to present Mr. McGuire's statement in full. I do not wish to read it or even make a full summary of it. I submit his statement and request that it be printed in the record.

There does not appear to me to be any need to read it in full. I merely want the committee to be familiar with the contents so that as you are studying your material that has been gathered over the many

months you have been researching this you will know we have a statement here and what it is about.

Duke Power Co. is probably the largest private developer of water resources in the entire Southeast. We have a very direct interest in water resources not only because of power development but as water resources relate to the growth of our entire area and its people. It was our company that made the first comprehensive development of a river basin in the United States in the Catawba-Wateree River development. It starts in the Blue Ridge Mountains of North Carolina and comes into the sand hills of South Carolina some 220 miles. Over a period of years we developed this 220 miles of river to the extent that 85 percent of its head will be used for waterpower when our last constructed development now underway is completed. And but for the fact that there are large industrial plants in the remaining 15 percent we might well have developed the full 100 percent of this river head of 220 miles.

Senator SCHOEPPEL. That was all done privately, as I understand.

Mr. HICKS. Yes, sir, done by private development. While we have developed this area for hydroelectric power we have done other things with these water resources.

These are the points that are contained in the middle of this index.

A very extensive forestry program over a period of 20 years which has contributed a great deal to the economy and to soil stabilization.

A complete flood control program. There are no longer floods on the Catawba-Wateree River. We have given attention to water supply, and cities up and down our river have utilized the water from our reservoirs for municipal water supplies. Some 400,000 people, it is estimated, get water from these reservoirs.

In recreation, we have paid a great deal of attention. Some 250 miles of shoreline along our reservoirs have been fully developed for recreational uses, for river cabin sites, for boat landings and for other recreational purposes.

We point out, too, that we have fully served the electric needs of our service area and by the way, for your information, our service area starts on the Virginia-North Carolina border and winds toward the southwest some 260 miles through the Piedmont Carolinas in a band 100 miles wide.

In this area are encompassed some 20,000 square miles. We go then from the Virginia border to the Savannah River which separates South Carolina and Georgia.

In serving the electric needs of our area the paper points out that we have served them at what we considered to be extremely modest rates. We show you to what extent those rates have been modest and to what extent they have promoted the use of electricity with our average residential customer using about 40 percent more than the national average in the electricity.

The CHAIRMAN. What is your average unit?

Mr. HICKS. What is the average residential unit?

The CHAIRMAN. Yes.

Mr. HICKS. It is something over 5,000 kilowatt-hours, Mr. Chairman, 5,041 kilowatt-hours last year as against the national average of 3,585, a difference of 40 percent.

We point out also that our development of water resources and the benefits which have stemmed from those have been done with private capital.

The CHAIRMAN. 5,000 kilowatt-hours is the total annual consumption for a daily average of about 130, is that it?

Mr. HICKS. Mr. Chairman, you are quicker with figures than I am. I do not know.

The CHAIRMAN. Is the 5,000 figure for the year, 5,041 kilowatt-hours per year?

Mr. HICKS. Yes, sir, for the year, 5,041 kilowatt-hours per year.

As I said, this development and these resulting benefits have been provided with private capital. Not only that, but we have contributed heavily, naturally, in taxes, both to the Federal Government and to State and local governments. We are not complaining about that. We are proud of that fact. Last year alone we paid in taxes some $40 million.

Our area has enjoyed an outstanding growth which is the next section on the paper here, down to page 12, as you look at the index. No other area of our size in the entire Southeast has the population that our Piedmont Carolina area has including, believe it or not, an area of 24,000 square miles which would include the cities of Atlanta, Birmingham, and Chattanooga. We have no large cities but we have a heavy population rather evenly distributed in this area.

Senator SCHOEPPEL. You have sufficient power to satisfy the needs of these people's reasonable demand together with the industrial development that has already been moving into your area generally?

Mr. HICKS. Yes, sir; not only that but we are looking ahead and are ready to satisfy all the demands we believe will develop in the foreseeable future as our area develops. That is the next section of this statement.

Senator JOHNSTON. I would like to say that his area covers an industrial area of North and South Carolina. A large percent of the mills, cotton mills and woolen mills are in this particular locality and we must bear in mind that North Carolina and South Carolina have approximately 50 percent of the textile manufacturing plants in the two States. I mean to say that this Duke Power Co. is right in the midst of that. This is where you serve.

Proceed.

Mr. HICKS. Yes, sir. Thank you, Senator Johnston.

We are looking ahead to the needs of the future in our area and this involves, of course, our needs for water resources. Our area has grown tremendously and all the predictions are that it will continue to grow with no slackening in the rate of growth. We point out in this paper our needs for the reasonably foreseeable future in electric power generation which of course involved the need for water resources. We ask that this committee study this statement we are submitting and that its recommendations not conflict but rather that it support our need for water resources in the years ahead because we believe and sincerely so that these water resources uses will be for the greatest good of the people we serve.

We hope that the information we have submitted in this statement will assist the committee in its planning and in its recommendations to the U.S. Congress.

I would ask, Mr. Chairman, that this statement of Mr. McGuire's appear in full in the record.

The CHAIRMAN. It will be done.

Mr. HICKS. Thank you, sir.

The CHAIRMAN. Thank you, Mr. Hicks.

(The statement follows:)

STATEMENT OF W. B. MCGUIRE, PRESIDENT OF DUKE POWER CO.

My name is W. B. McGuire. I live in Charlotte, N.C., and am president of Duke Power Co. Personally, and on behalf of my company, I thank the Senate Select Committee on National Water Resources for the opportunity of appearing before you today.

Your committee, as part of its national survey of water resources, is today receiving information on water resources in the southeastern United States. Our company appears before you as probably the largest private developer of water resources in the entire Southeast. We hope we can present some facts which will assist your committee in making its recommendations.

DUKE POWER CO.

Duke Power Co. supplies electric service to the Piedmont section of North Carolina and South Carolina. The area served by the company embraces a belt about 100 miles wide and 260 miles long, extending from Virginia on the northeast to Georgia on the southwest and having a total area of about 20,000 square miles.

The company's electrical generating facilities consist of 504,000 kilowatts installed capacity in 32 hydroelectric plants and 2,554,000 kilowatts nameplate capacity in 7 steam electric generating plants, a total of 3,058,000 kilowatts.

Duke Power Co. is concerned with the conservation of water resources in relation to requirements for its hydroelectric and steam electric generating plants, both present and future. It is also concerned with water resources because of the importance of such resources to the growth and well-being of the urban and rural population and industry in the area which our company serves. It is believed that a review of the results achieved by Duke Power Co. in the conservation and development of water resources will assist this committee in determining the appropriate functions of the Federal Government in the development of water resources, particularly in the Southeast.

Water resource development

The Nation's first comprehensive development of an entire river basin for electric power and other beneficial purposes was undertaken by Duke Power Co. This was the developemnt of the Catawba-Wateree River from its rise in the Blue Ridge Mountains of North Carolina southeastward some 220 miles to the sandhills of South Carolina. For many years the Catawba-Wateree has been appropriately referred to as "the most completely electrified river in the world." As such, it has been studied as a model by engineers in this country and from abroad.

The development of the Catawba-Wateree River represents the successful realization of a long-range, comprehensive plan that was conceived about 1903, and was based on a new concept in electric power service. Instead of constructing at small individual sites, as had been customary, development of an entire river valley was projected with large seasonal-storage reservoirs which would permit the maximum utilization of water, and with standby steamplants, to insure continuity of service.

The Catawba-Wateree River flow fluctuated widely, ranging from sudden and destructive heavy flood discharges to minimal discharges in recurring periods of prolonged droughts. Duke Power Co. adopted a program designed to conserve the natural resources of the river to the fullest, and to develop within limits of economic feasibility every foot of available head.

The drainage area of the Catawba-Wateree included in the plan of development covers about 4,750 square miles. At the river's mountainous source, the average annual rainfall is over 50 inches, with about 42 inches across the Piedmont and sandhills area. The runoff is sufficient to produce an average riverflow of 4,586 cubic feet per second at the gaging station a few miles down-

stream of the North Carolina-South Carolina border. At this same point, the minimum daily unregulated flow is estimated at 411 cubic feet per second, and the July 1916 flood peak exceeded 300,000 cubic feet per second. The company's plants have harnessed this variable flow and put it to use.

In 1935, the extent of the basin's development was recognized by Mr. A. E. Morgan, then Chairman of the Board of the Tennessee Valley Authority. Mr. Morgan wrote in the December 1935 issue of Civil Engineering:

"On the Catawba River in North and South Carolina, the Duke Power Co. has worked out a completely unified development for power with results, I understand, that reflect great credit on the technical skill involved in that great undertaking."

Cowans Ford Station, now under construction, will complete the economically feasible development of the Catawba-Wateree River. Including the ultimate capacity of 350,000 kilowatts at Cowans Ford, Duke's 13 hydroplants on the Catawba-Wateree will have a total capacity of 800,940 kilowatts and a usable storage capacity of 1,272,000 acre-feet, equivalent to 499 million kilowatt-hours of energy. The entire Catawba-Wateree project has been granted a 50-year license by the Federal Power Commission as project No. 2232.

With Cowans Ford, the company's 11-site development on the Catawba-Wateree River will utilize 893 feet, or 85 percent of the total fall of 1,052.5 feet in the 220 miles of river covered by these sites. Large industrial plants of the Bowaters Paper Co., Celanese Corp., Great Lakes Carbon Co., and Springs Bleachery located on the river preclude hydroelectric development of the balance of the river fall.

In addition to the hydroelectric system on the Catawba-Wateree River, Duke Power owns 20 other smaller hydroelectric plants having a total installed capacity of 53,000 kilowatts. We have provided hydroelectric development within our area when it was economically justified and will continue to do so.

Steam generation.—In addition to its hydroelectric capacity, the fully developed Catawba-Wateree River system has provided needed sites for steam electric generating plants.

About 1928, the company's system began to change from hydro with auxiliary steam to a steam system with hydro used for peaking. Today virtually the company's total hydro capacity is used for peaking purposes.

Large steamplants such as our Riverbend plant and our new Allen plant located on the Catawba River now carry the baseload in our system. Plants such as Allen and Riverbend require a large quantity of water for condensation of steam. On some of the Catawba-Wateree hydro reservoirs are found peninsulas surrounded by large areas of evaporative cooling surface which separate by many miles the intake and discharge of cooling water and can support steamplants with capacities many times larger than could have been developed with only the available riverflow. A number of steamplant sites are available on existing reservoirs and the Cowans Ford Reservoir for construction of plants to supply future power requirements of the central section of the Piedmont Carolinas.

Water resource management

Forestry.—The company's forestry department was established in 1939 for the purpose of managing and promoting good soil and water conservation practices on company land, both in the Catawba-Wateree Basin and along the Savannah River. This goal has been vigorously pursued.

Reforestation has played a major part in the company's program of watershed management. In the process of developing its reservoirs, and in providing for future development, the company has acquired over 200,000 acres of land not presently flooded. About 95 percent of this acreage is now under scientific management by the company's professional foresters. Open land, formerly devoted to cotton farming and subjected to severe erosion, has been gradually retired and reforested for watershed protection and timber production.

In the last 18 years, 25 million seedlings have been planted on the company's lands. Overall timber production from these lands is at a sustained annual rate of 15 million to 20 million board feet of timber, and 45,000 cords of pulpwood. This timber harvest adds $2 million annually to the local economy and gives jobs to about 600 woods-worker families.

In cooperation with the Research Branch of the U.S. Forest Service and the Furniture Council within the North Carolina Forestry Association, the company has provided a forest area for study and experimentation in management of hardwood timber for increased and improved yield.

The company's land suitable for cultivation is largely rented for farming under expert supervision in accordance with good farm practices, including soil conservation, crop rotation, terracing, cover crops, etc. On a number of farms, the company has undertaken extensive improvements to find out, and to demonstrate, what good soil management can do.

The company cooperates with State and Federal agencies, including the North Carolina State Forestry Service, the South Carolina State Commission of Forestry, the South Carolina Extension Service, the North Carolina Extension Service, the U.S. Soil Conservation Service, the Research Branch of the U.S. Forest Service, and county agents in their activities of educational and research, to bring about better management and use of land and water resources.

The results of watershed management are becoming increasingly apparent. Whereas in past years the reservoirs on the Catawba-Wateree River were almost always muddy, now they are clear a greater portion of the time. By good soil management, the land is made a useful storage reservoir which absorbs the rainfall and then releases it over a longer period. For example, grain crops have withstood drought that severely damaged adjoining crops not similarly managed, and yields have been substantially greater than average yields in the area.

Thus, the company has developed an ambitious and effective program of soil and water conservation practices in the management of its watershed properties which provides an example of good land management to other landowners.

Flood control.—The operation of the company's system of reservoirs on the Catawba-Wateree River has resulted in substantial control of floods. The highest flood on record for the upper reaches of the Catawba was in August 1940. Prior to that time the previous high flood was in July 1916. As a result of the operation of the company's Bridgewater Reservoir, the flood stage at Morganton, N.C. for the 1940 flood was 14.5 feet below the 1916 mark; and at Rhodhiss, N.C., just below the Rhodhiss dam, the 1940 flood stage was 14 feet below the 1916 level. In discussing the nature of the 1940 flood, U.S. Geological Survey Water Supply Paper No. 1066 reports that the peak discharge below the Bridgewater Dam was reduced by 69 percent; and below Rhodhiss Dam, by 38 percent.

Water supply.—Duke Power Co. has given attention to its Catawba-Wateree River reservoirs as sources of water supply, considering both quantity and quality of water. Development of the river basin has resulted in the availability of a practically unlimited source of water for municipal, industrial, and agricultural use.

Eight towns and cities, having a total population of almost 400,000, utilize the company's reservoirs as their source of water. The communities drawing from Duke Power Co.'s reservoirs have a source of water supply that appears adequate for all demands that can reasonably be anticipated. There is no charge for water drawn from Duke Power Co.'s ponds.

For 37 years the company has been engaged in a mosquito control program. This work, under the full-time supervision of a company physician, formerly with the Public Health Service, has included research, detailed surveys of potential breeding grounds, and full-time spraying of the waters of each reservoir during the summer months. The virtual elimination of malaria from the Catawba River Valley testifies to the success of this program.

Also the company has devoted considerable time, study, and effort to the matter of improving water quality in the Catawba-Wateree.

The company's activities in maintaining the quantity and quality of reservoir waters to supply all uses of the area have been systematically pursued at company expense without subsidy. In this area, the company's contribution as a community citizen has been substantial.

Recreation.—Duke Power Co. has actively promoted large-scale public recreation on company lands and reservoirs, which has resulted in a water sports vacation-land for the Piedmont. With a scarcity of natural lakes in the Carolinas, the reservoirs on the Catawba-Wateree River have proven highly popular for recreational use. Along the shores of these lakes, the company has made available year-around berthing facilities for pleasure boats, picnic grounds, concessions to restaurants and marinas, boat launching areas, and summer homesites. The hundreds of summer homesites are lake fronts about 1 acre in size, leased to individuals at a nominal charge.

The 10 existing lakes on the Catawba-Wateree River have a total of 30 public-access areas provided by Duke Power Co. for free public use. These lakes provide good fishing for the area. More than 250 miles of the shoreline

of these lakes has been fully developed for summer homesites and public access areas. The company will provide similar recreational facilities on the 33,000 acre Cowans Ford Reservoir which is now being cleared.

The development and maintenance of public access areas for boating and fishing is coordinated with the North Carolina Fish and Wildlife Commission and the South Carolina Wildlife Resources Department.

Serving the electric needs of the area

Our company today supplies approximately 703,000 customers, about 614,000 of which are residential customers. It is estimated that the company supplies directly over two-thirds of the rural customers in its service area, the remaining one-third being served by REA's and to a small extent, by municipal extensions. The REA and municipal distributors purchase power from our company. In Duke's service area over 99 percent of the farms are receiving electric service.

Our company's rates for service are the same for its rural as for its city customers. Our residential customers are served at an average rate of 1.99 cents per kilowatt-hour, which is 20 percent below the national average, and use an average of 5,014 kilowatt-hours per year, which is 40 percent above the national average of 3,585 kilowatt-hours.

Duke Power's total generation in 1928 of 1.8 billion kilowatt-hours rose to 2.6 billion in 1940, to 6.8 billion in 1950 and to 13.7 billion in 1959. Annual increases of 1 billion kilowatt-hours or more occurred in each of the years 1941, 1950, 1955 and 1959. The year 1959 saw the company's total production increase by 1.4 billion kilowatt-hours.

There is no shortage of power in the Duke Power Co. service area. Our advance planning and construction program enabled us not only to meet the requirements of our service area in the war and postwar years, but in addition, to assist in meeting critical electric power requirements outside the Duke territory. Between 1940 and 1945 our company, to meet defense needs, delivered to the Tennessee Valley Authority and to the Aluminum Co. of America large blocks of power for the making of aluminum.

Duke Power Co. will continue to meet all of the electric needs of its service area at rates which will continue to promote the expanding use of electricity.

Benefits provided with private capital

We are proud of the fact that the activities of our company which we have here reviewed for the committee, that is those of flood control, water and soil conservation, recreation, and an ample supply of electricity, have been provided with private capital and without Federal subsidy. Not only has our area received these benefits without Federal subsidy, but while we have have been providing these area needs, Duke Power Co. has been contributing heavily in taxes to the Federal and local governments. In the past 20 years alone our company has paid in taxes to the Federal Government $204 million and $175 million to State and local governments, a total of $379 million. In the year 1959 the company paid taxes in excess of $40 million consisting of more than $24 million in Federal and more than $16 million in State and local taxes which amounted to 25 cents of each dollar of revenue collected.

We are proud, too, of the fact that along with the natural resource benefits we have provided in our area, we have been able to meet all needs for electric service at modest costs to our citizens.

Outstanding growth of area

The growth of the area served by Duke Power Co. has been phenomenal. A comparison with other areas of the Southeast shows that there is a greater population in the 24,000-square-mile area embracing counties we serve than in any other 24,000-square-mile area in the Southeast, including the areas surrounding Atlanta, Birmingham, New Orleans, Memphis, Knoxville-Chattanooga-Nashville, Dallas-Fort Worth, Houston, Miami, Richmond-Norfolk, and even the 24,000-square-mile area including Atlanta-Birmingham-Chattanooga. Today, there is a greater business volume in the 24,000-square-mile area of the Piedmont Carolinas than in any of the above areas except that including Atlanta-Birmingham-Chattanooga.

Industrialization began 50 years ago with the electrification of the textile mills. Gradually, however, other industries began an ever-increasing expansion in the Piedmond. These industries have built plants which manufacture household and industrial chemicals, electric storage batteries, synthetic fibers, transformers, treated lumber, pulp and paper products, furniture, textile materials and

finished products of great variety, processed minerals, guided missiles, dyes, carbon electrodes, industrial machinery and tools, and a host of other products.

Needs of the future

Duke Power Co. is planning ahead to meet the needs of the rapid industrial and population growth of its service area. In addition to plants now under construction, we have announced plans for a large steam plant on the Savannah River between the Clark Hill and Hartwell Dams. We own the land needed for this development, having purchased it many years ago for future development. The initial capacity of this Savannah River plant will be 700,000 kilowatts available for operation about 1965, with construction beginning 2 to 3 years before. Additional units will be added as load growth requires to an ultimate plant capacity of 2 million kilowatts.

Large blocks of power are now transmitted to the southwestern portion of our service area from other points on our system. The present annual requirements of the most southwestern segment of our territory of 4.8 billion kilowatthours is expected to double by 1968. Obviously, it is desirable that additional generating facilities be provided in this portion of our service area.

The output of our announced Savannah River p'ant would not, however, be used solely in the locality of the plant. It would be fed into the integrated transmission line system which interconnects our entire service area.

There is no other river in the southwestern portion of Duke's service area having a streamflow sufficient to provide cooling water for the 2 million kilowatts steam plant we propose.

We bring this matter before the committee because it presents a fundamental question in the development of water resources. The Army Engineers have recommended the construction of Carters Island and Goat Island hydroelectric projects on the Savannah River, both to be between the Clark Hill and Hartwell projects. The Carters Island project as proposed would flood to a depth of approximately 35 to 40 feet the site of the diversion dam necessary for our steamplant and prevent us from proceeding with our plans for this development. However, the plans for our plant would permit both our plant and Carters Island to be built if our plant is built first and the Carters Island project is slightly modified. We have pointed out to the Army Engineers the possibi'ity of making our plant and the Carters Island project compatible. But we understand that on March 30, 1960, the Board of Review for Rivers and Harbors, without any reference to harmonizing Carters Island and our steamplant, recommended construction of Carters Island as originally proposed.

We have prepared the following comparison for the committees' study:

Estimates for ultimate installations

	Duke Power Co. 2,000,000-kilowatt steam plant	Federal hydroelectric plant at Carters Island
Construction costs	$280,000,000	$56,287,000
Annual cost of operation and maintenance, including payroll, but less fuel	$2,500,000	$405,000
Annual cost of fuel, including local railroad delivery	$36,000,000	0
Annual local and State taxes, estimated on FPC basis	$7,450,000	0
Annual Federal income taxes, estimated on FPC basis	$9,240,000	0
Installed capacity	[1] 2,000,000	[1] 199,800
Annual production	[2] 10,000,000,000	[2] 272,600,000

[1] Kilowatts. [2] Kilowatt hours.

In this comparison, the committee will see that the use of the Savannah's water resources for condenser cooling in Duke's steamplant will result in almost 37 times as much electricity as would be produced by the proposed Carters Island development. It will be observed that Duke's plant will cost substantially more to build and operate, and will contribute heavily in taxes. It is evident that the economic benefits to the affected area will be far greater for the steamplant than for the hydroelectric plant.

But one may ask, Are there not other benefits stemming from the Carters Island project? The answer is, "Virtually none." Absolutely no flood control or navigation benefits are ascribed to the project. Besides power, the only

annual benefit which the Army Engineers attribute to Carters Island is $166,500 for recreation. It would appear that the water recreational needs of the area will be fully met by the Clark Hill and Hartwell projects. Carters Island then is not a true multipurpose project, but rather is strictly a power project, and one which will produce relatively little firm power.

Certainly, in some instances where genuine Federal and regional purposes are to be served, multipurpose projects are warranted. But it seems incredible that there would be recommended a project which the evidence shows will produce little benefit and will cause great economic loss to an area.

This is a water resources problem that deserves the careful attention of this committee and the Congress. We hope that it will receive your serious study and consideration, and that you will recommend that Federal projects not be built which will block more economically desirable non-Federal projects.

Conclusion

We have endeavored to describe the participation of a privately owned but publicly regulated utility in the economic growth and development of an important section of the country. We have pointed out that this participation has included not only meeting the electric service needs of this rapidly growing area but has, in addition, provided substantial contributions in the development of the water resources of this section.

We believe that the functions of the Federal Government in the development of water resources should consist principally of the following:

1. The furnishing of basic services such as streamflow gaging and records, weather reports and area topographical surveys;
2. Promoting soil conservation;
3. Basic research and cooperation with State agencies dealing with conservation of water resources, pollution control, and fish and wildlife service; and
4. Where genuine Federal purposes will be served, in construction of multipurpose dams.

We feel that it is not a legitimate function of the Federal Government to make use of water resources for the generation, transmission, and sale of electric power on a public utility basis. In a private enterprise economy, such as ours, the responsibility of supplying the electric power requirements of the public should continue to rest primarily on the investor-owned electric utilities. The water resources policy of the Federal Government should be so designed that it will not discourage or injure private enterprise in the field of electric power. To the extent that the Federal Government, in the exercise of its legitimate functions, does develop water resources, it should carefully avoid unfair competition with private enterprise in the field of power generation.

In order that the Federal Government not engage in unfair competition with private enterprise in the best use of water resources, we urge that this committee recommend to the Congress the following basic principles:

1. The Federal Government should construct no hydroelectric power project which will preclude the construction of more economically desirable non-Federal power developments which represent a more beneficial use of water resources.
2. The Federal Government should construct only those multipurpose dams which will serve a genuine Federal purpose and which will be economically feasible taking into consideration foregone taxes. Cost involved in constructing such dams should be allocated fairly between power and other functions, and the price of power should be fixed on the basis of the full cost of the power including foregone taxes.
3. In order that any benefits from governmental development of water resources may be distributed without discrimination, the so-called preference clauses should be eliminated so that all members of the public, whether they are served by private company or by public agency, will receive Government-produced power on the same basis.
4. If the Federal Government undertakes to develop water resources for the supply of electric energy on a public utility basis, its rates should include the full equivalent of taxes, both local, State and Federal, paid by the customers of privately owned utility companies. The Government rates should also include a fair return on the investment in plants and facilities.

To the extent that Government rates do not include the full tax and fair return elements, such rates discriminate against taxpaying industries and residents served by private utilities.

Senator JOHNSTON. Senator Kerr, the next witness, Walter Bouldin, has sent his statement in and asked that it be filed as part of the record.

The CHAIRMAN. We will be very glad to have it in the record. I am acquainted with Mr. Bouldin.

Senator JOHNSTON. That is from the Alabama Power Co.

The CHAIRMAN. I am glad to have his statement.

(The statement follows:)

ALABAMA POWER CO.,
Birmingham, Ala., May 10, 1960.

Hon. OLIN D. JOHNSTON,
U.S. Senate,
Washington, D.C.

DEAR SENATOR JOHNSTON: Thank you very much for your letter of May 3 and for your many courtesies in connection with the National Water Resources hearing scheduled for May 13 in Columbia.

I regret very much that developments here have made it impossible for me to make the trip to Columbia, and I am going to have to avail myself of the opportunity of submitting a written statement only. As suggested by Mr. Schad, we are mailing to you today five copies of the statement to the Capitol Room of Hotel Wade Hampton and five copies to Mr. Schad in Washington.

I regret that I shall not have a chance to thank you personally at the hearing.

With best wishes.

Sincerely,

WALTER BOULDIN.

STATEMENT OF WALTER BOULDIN, PRESIDENT, ALABAMA POWER CO.

Mr. Chairman and members of the committee, let me first express my thanks to the committee for the privilege of appearing here today as a representative of The Southern Co. and its affiliates.

My name is Walter Bouldin. I live in Birmingham, Ala. I am president of Alabama Power Co. and have been associated with the affairs of this company for over 30 years. Alabama Power Co., Georgia Power Co., Gulf Power Co., and Mississippi Power Co. are the operating companies of The Southern Co. and form an integrated electric system. Recently connected to this integrated system is the large steam-generating plant of Southern Electric Generating Co. This company is jointly owned by Alabama Power Co. and Georgia Power Co., and its Coosa River plant went into operation on May 1, this year. The area served by these companies is approximately 120,000 square miles with a population in excess of 6,500,000. It includes most of the States of Georgia and Alabama, part of northwest Florida, and the southeastern part of Mississippi. These companies supply all but a relatively small part of the power requirements throughout their respective service areas. At the end of December 1959 the four operating companies served more than 2 million electric customers, directly or indirectly. The Southern Co. system has more than $1 billion invested in its properties.

Georgia Power Co. and Alabama Power Co. have had long experience in the development of the water resources of the areas served by them, beginning with the completion of Georgia Power Co.'s Mitchell Bridge Dam on the Middle Oconee River in 1896 and the completion of Lay Dam in 1914 on the Coosa River by Alabama Power Co. Presently Georgia Power Co. is operating 21 hydroelectric plants on the Chattahoochee, Oconee, Tallulah, Tugalo, Flint, Ocmulgee Rivers and Pataula and Whitewater Creeks with a rated capacity of 417,270 kilowatts. Alabama Power Co. operates 6 hydro plants—3 on the Tallapoosa River and 3 on the Coosa River—with a combined capacity of 489,700 kilowatts.

Of Georgia Power Co.'s projects, the two most recently completed are the Sinclair Dam on the Oconee River at Milledgeville, Ga., completed in 1953 with a capacity of 45,000 kilowatts, and the Oliver Dam on the Chattahoochee River at Columbus, Ga., completed in November 1959 with a capacity of 60,000 kilowatts.

The Sinclair Dam particularly demonstrated the flood control benefits to the Altamaha Valley downstream from the dam just after this project was completed. In fact, just after this project was completed, one of the largest floods of record occurred. The Sinclair Dam reduced the flow at the Milledgeville gage to less than one-third of that which would have occurred if the dam had not been available.

The Oliver Dam, in addition to its hydroelectric and recreational benefits, is of particular importance as a municipal water supply to the metropolitan area of Columbus, Ga. The city of Columbus has constructed a new municipal water-pumping station on the dam's reservoir, which assures an adequate supply of water for many years to come for that area—the second largest metropolitan area in the State of Georgia.

The full utilization of the Chattahoochee River is brought nearer to realization by the completion of Oliver Dam. This dam, which has provisions for the future installation of navigation locks, together with Georgia Power Co.'s five other existing Chattahoochee River developments, provides a series of navigable water pools from Columbus to West Point, Ga. With the redevelopment of one of the existing dams—North Highlands—efficient utilization of the entire head of 320 feet will be possible between the two cities. The redevelopment, which starts this spring, consists of replacing an antiquated powerhouse at the North Highlands plant with a modern powerhouse consisting of four generating units whose capacity totals 30,000 kilowatts.

Georgia Power Co. currently has under construction, immediately upstream from the city of Atlanta, the redevelopment of the Morgan Falls Dam, which was originally completed in 1903. The purpose of this redevelopment is to re-regulate the peaking water flows from the Corps of Engineers' Buford Dam, which is upstream from Morgan Falls. The redevelopment consists of raising the Morgan Falls reservoir 6 feet to provide sufficient storage to catch the Buford peak flows. This plant will have a capacity of 16,800 kilowatts. The peak flows will arrive in Morgan Falls around midnight and be released the following day and on week ends. This arrangement will supply vital dilution for discharge of sewage from the city of Atlanta. The great value of this re-regulation through the city of Atlanta is indicated by its willingness to share one-half of the redevelopment cost.

The Coosa River development by the Alabama Power Co. is one of our greatest undertakings.

An aspect of this development which seems to us especially significant is the willingness of the people of Alabama to entrust our investor-owned company with the responsibility for the major part of the development of that river. On october 29, 1953, the Coosa-Alabama River Improvement Association passed a resolution asking Alabama Power Co. to undertake the development of the Coosa River. As soon as the company's willingness to undertake such development was known, it was deluged with resolutions from farm, labor, civic, and business organizations all over the State urging it to proceed. Some of these resolutions have been reproduced in the booklet made exhibit A to this statement. There were hundreds of telegrams and letters from individuals to the same effect. There was no dissenting voice in the State except a very few landowners whose lands were involved.

At this time the development of the Coosa River could not be undertaken by an investor-owned company, because the Rivers and Harbors Act of 1945 had authorized the development of the stream by the Federal Government and thus removed the jurisdiction of the Federal Power Commission to grant any license to an investor-owned company. In order for Alabama Power Co. to proceed, it was necessary to obtain an act of Congress restoring the jurisdiction of the Federal Power Commission.

Negotiations as to the form this legislation was to take were conducted for months with the Corps of Engineers and other Government representatives. As finally drafted, the bill contained provisions assuring a prompt start and completion of the program, a large measure of flood control, and regulation of the operation of the projects by the Secretary of the Army. Finally, the provisions of the bill were agreed upon, and it was sponsored in the Senate by Senators Lister Hill and John J. Sparkman and was introduced in the House by the Honorable Albert Rains of Gadsden, and sponsored by all the Alabama Congressmen but one. It also had the enthusiastic support of the late Representative

Henderson Lanham of Rome, Ga. House Report No. 1682, which dealt with identical bills endorsed by Alabama Congressmen, contains this paragraph:

"The committee held hearings on these bills at which testimony was received from the bills' sponsors, representatives of Government agencies, farm and business groups, and civic leaders. Without exception these witnesses expressed their feeling of the urgent need for the development of electric power on the Coosa River such as will be made possible by this leigslation. In addition, the committee has received numerous expressions and resolutions from various parts of the State of Alabama, including the Governor, favorable to the development of this project."

Senator Lister Hill, in the course of consideration of the bills by the Senate, said on June 15, 1954:

"Since 1945, despite repeated efforts to do so, it has not been possible to have funds appropriated for the construction of that dam. Not one dollar has gone into the construction of the dam. The people of Alabama are very much interested in having the development go forward. The Alabama Power Co., which serves the area of Alabama in question, has stated that if it could go before the Federal Power Commission and ask for and receive a license under the terms of the Federal Power Act, it would be glad to build, not one dam, but five dams.

"The purpose of the bill is simply to deauthorize the construction of Howell Mill Shoals Dam by the Government, and to provide that the Alabama Power Co. may apply to the Federal Power Commission for a license, under certain terms and conditions set forth in the bill, and to have the Federal Power Commission determine, first, whether a temporary license shall be granted, and then whether a permanent license shall be granted to the power company to go forward with the construction of the dams under the terms and conditions of the Federal Power Act and of the bill.

"Under the terms of the bill, the Alabama Power Co. binds itself to meet the requirements for flood control, such as would have been met had the Howell Mills Shoals Dam been constructed by the Federal Government. The power company binds itself to provide for the basic provisions for navigation, and it also binds itself to build 5 dams within 10 years from the time the construction on the first dam begins. The Alabama Power Co. even goes so far as to bind itself to build first the dam which will mean most for flood control, unless for some good reason the Secretary of the Army, which means the Corps of Engineers, should select some other dam."

The act was passed by the House on June 2, 1954, by practically a unanimous vote. The bill passed the Senate on June 15, 1954, without a dissenting vote and was signed by the President on June 28, 1954. The company is now proceeding to complete the development of the Coosa River under license of the Federal Power Commission.

The Coosa River rises in Georgia, flows into Alabama, and, some 275 miles from its source, joins the Tallapoosa River near Montgomery, Ala., to form the Alabama River, which in turn joins the Warrior-Tombigbee system to form the Mobile River and Mobile Bay.

Throughout its course the Coosa River falls almost exactly 450 feet, and the development which the Federal Power Commission has licensed our company to carry out will complete the development of that 450 feet of fall and change the stream into a series of seven navigable lakes. Alabama Power Co. presently operates three projects on the Coosa River—Jordan, Mitchell, and Lay Dams—and is licensed to build four new dams and to more than double the capacity of Lay Dam, the uppermost of the existing developments. The capacity of the existing hydro plants is 253,500 kilowatts, and the capacity of the licensed installations is 425,450 kilowatts, making a total Coosa development of 678,950 kilowatts.

Construction of Weiss Dam, the first of the new Coosa projects, began July 31, 1958. This project, which involves a diversion dam and a canal which shortens the navigation channel some 15 miles, is approximately half completed. It is scheduled to go into operation in June 1961 and to have an ultimate installed capacity of 87,750 kilowatts. Construction of the second of the new Coosa River dams will begin in 1960, and the entire Coosa program is scheduled for completion by July 31, 1968.

Power development of the Coosa River involved in these projects is only part of the story. For more than 100 years the people of the Coosa Valley have dreamed of making that stream a waterway to the sea. When our projects are

completed, a long step in the realization of this dream will have been made. All of the existing projects on the river contain, and all of those which we propose to build will contain, basic navigation facilities. When locks are installed by the Government, a modern waterway will come into being. Only three more locks and dams on the Alabama River will be necessary to make the entire Coosa-Alabama waterway from Rome, Ga., to Mobile, Ala. a great artery of commerce. An organized effort is being made by the citizens of the Alabama River Valley to obtain appropriations from Congress for construction of the Alabama River projects. Alabama Power Co. is studying the development of these Alabama River dams to determine whether we can participate on an economical and helpful basis.

The construction of the Coosa River projects will make a great contribution to the economy of the area. The flow of the Coosa River, even in dry periods, is amply sufficient to provide water for industrial and domestic purposes; however, the development of the Coosa Valley industrially has been sorely handicapped by the fact that industries requiring large quantities of water were unable to build on the stream because, until the scope of the development was defined, the water levels of the Coosa could not be foreseen or planned for. Those water levels are now fixed by the terms of Alabama Power Co.'s license, and the entire Coosa Valley will thus become an almost ideal site for large industrial users of water.

On the Warrior-Tombigbee River system, a similar transformation is taking place. Fifty years ago, the Warrior-Tombigbee system from Mobile to the port of Birmingham was made navigable in a primitive fashion by a series of 17 locks and dams. Over the years, these old locks and dams have become obsolescent and utterly inadequate to handle the needs of the area. For some time now the Corps of Engineers has been engaged in modernizing this waterway. The modernization consists of replacing 15 of the 17 locks and dams by 4 modern locks and dams so that a series of 6 dams will provide modern navigation all the way from Mobile to the port of Birmingham. Two the four modern locks and dams have been completed at Demopolis and Warrior; a third one is under construction at Jackson, Ala.; and the fourth one, at Lock 13, is in the design stages.

The development on the Warrior River which Alabama Power Co. has been licensed by the Federal Power Commission to undertake is the construction of a powerhouse in an existing Government dam, Bankhead Dam, and the construction of a new dam and powerhouse, the Lewis Smith Dam, in the upper reaches of the Warrior River. The capability of Smith Dam will be 200,000 kilowatts and in Bankhead Dam 45,000 kilowatts. The company also has filed application for license to install power facilities in the proposed Government dam at Lock 13 on the Warrior River near Tuscaloosa.

The Lewis Smith Dam, now about half completed and scheduled for operation in 1961, is being built of nearly 6 million cubic yards of earth and rock and will be approximately 300 feet high. It is designed, even when the power pool is full, to contain the greatest flood of record without any water going over the spillway. There is thus no way of knowing how often, if ever, there will be any overflow from that dam. Since the dam is built on one of the major forks of the river, the Sipsey, its ability to contain the flood of record will make a very substantial contribution to flood control in the valley to the particularly great benefit of the city of Tuscaloosa.

Even more important than the flood control features of the Smith Dam will be its contribution to the navigable capacity of the Warrior River. In low flow periods the Warrior does not have enough flow to provide for the operation of the modern system of locks being installed. The release of water from the Smith Dam during dry seasons insures ample water throughout the year for preserving the functioning of the navigation facilities.

The release of water at the Smith Dam has an even more important function. Unlike the Coosa, where the handicap to valley development was the uncertainty of water level, the limiting factor of valley development of the Warrior is simply a lack of water during dry periods. During such periods, the natural flow of the water approaches zero; and, thus, the river valley has been totally unsuitable as a source of domestic or industrial water supply. An outstanding example of the value of this aspect of the development is the fact that the city of Birmingham, which has sorely needed an additional source of industrial water for several years, plans to have completed by the time the Smith Dam is in operation a pipeline to tap the flow from the dam sufficient to supply the industrial needs of the city of Birmingham for industrial water for many years to come.

The Smith Dam makes another valuable contribution in that the increased flow of fresh water will push the upper limits of salt water downstream several miles, thus making more industrial fresh-water sites available in the fast-growing Mobile area.

The completion of all these developments on the Coosa-Alabama-Warrior-Tombigbee River systems will provide 627,950 kilowatts of new hydro capacity and 1,043 miles of modern navigable waterways, which will connect the great industrial areas of Gadsden and Birmingham and the capital city of Montgomery to the sea and will provide industrial sites and water in plenty throughout the entire 1,043 miles of river valley.

From the sketch may attached to this statement as exhibit B showing the existing and authorized developments on the Coosa-Alabama and Warrior-Tombigbee River systems, it is easy to see how much of the area of Alabama will be benefited by these two great river programs.

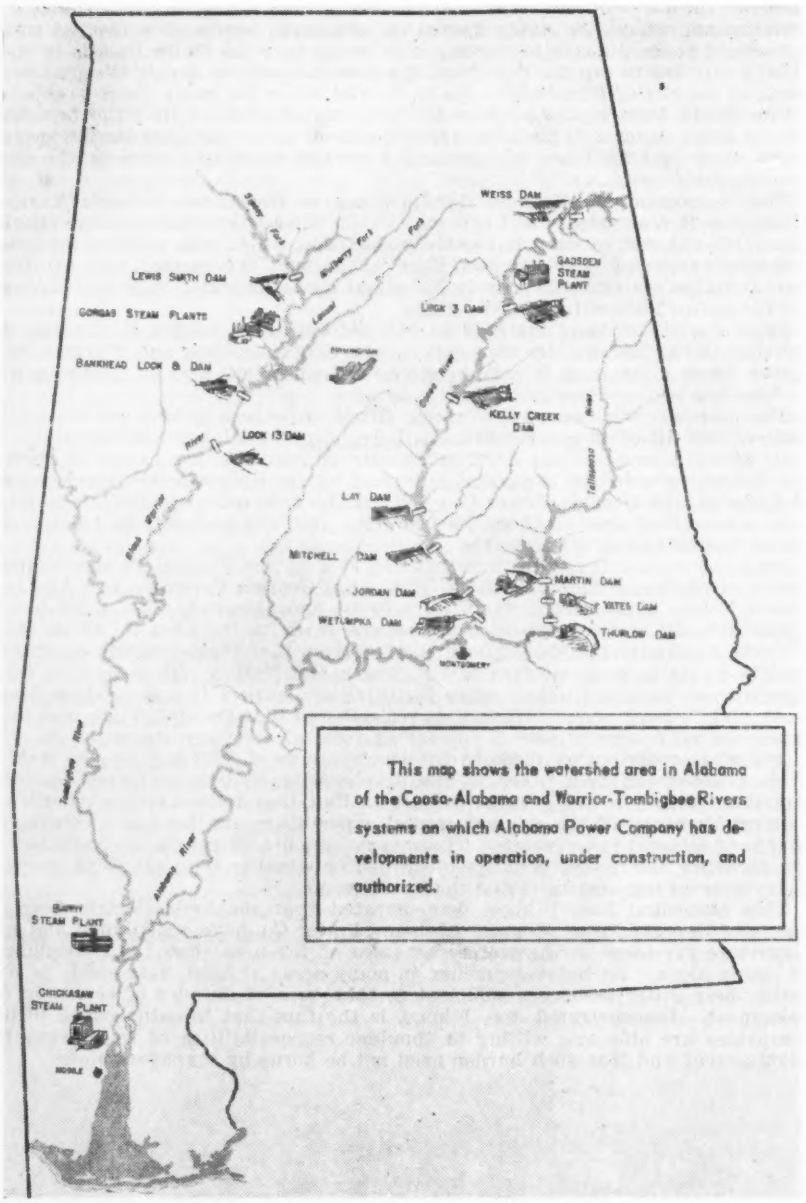
The cost of our Coosa and Warrior River projects will be more than $190 million, and all of this expenditure will be borne by Alabama Power Co.

Of direct interest to the greatest number of people is the extent of recreational area provided by the 30 lakes formed by the hydroelectric developments of Alabama and Georgia Power Cos. When the reservoirs are full, these lakes have a combined area of about 150,000 acres and will undoubtedly become one of the Nation's great playgrounds.

With the completion of projects now licensed by the Federal Power Commission in Georgia and Alabama, the investment of Georgia Power Co. and Alabama Power Co. in hydroelectric facilities will be approximately $297 million. In addition to all of the physical contributions made to the area in which these projects are located, it should never be forgotten that these projects contribute greatly to the general welfare of the States and Nation. These plants, their reservoir lands, and all their other facilities are subject to and produce State, local, and Federal taxes. When it is remembered that Federal, State, and local taxes annually approximate 5 percent of total electric investment, it is easy to see what contribution these hydro developments of $297 million are making to the general welfare in taxes. Thus, developments by investor-owned facilities contribute doubly to the general welfare in that they relieve our overburdened Federal Treasury of the original capital expenditure and become a continuing source of Federal tax revenue. These same benefits, of course, accrue whether the facilities are completely investor-owned or whether they are joint projects of investor-owned companies and the Government.

This statement has, I hope, demonstrated that the hydroelectric developments of Georgia Power Co. and Alabama Power Co. have contributed and will contribute far more to the water resources of the area than the development of power alone. Such developments, in many areas at least, have made or will make their water resources sufficient to take care of decades of economic development. Demonstrated, too, I hope, is the fact that investor-owned utility companies are able and willing to shoulder responsibilities of water resource development and that such burden need not be borne by taxpayers alone.

EXHIBIT B


WEISS DAM
LEWIS SMITH DAM
GORGAS STEAM PLANTS
BANKHEAD LOCK & DAM
LOCK 13 DAM
LOCK 3 DAM
GADSDEN STEAM PLANT
KELLY CREEK DAM
LAY DAM
MITCHELL DAM
JORDAN DAM
WETUMPKA DAM
MARTIN DAM
YATES DAM
THURLOW DAM
MONTGOMERY
BARRY STEAM PLANT
CHICKASAW STEAM PLANT
MOBILE
This map shows the watershed area in Alabama of the Coosa-Alabama and Warrior-Tombigbee Rivers systems on which Alabama Power Company has developments in operation, under construction, and authorized.

Senator JOHNSTON. The next witness is William T. Crisp.

The CHAIRMAN. All right, Mr. Crisp.

Going back to another witness, Mr. E. H. Agnew, president of the South Carolina Farm Bureau Federation——

Mr. SCHAD. Senator, we have his statement, and I suggest it be put in the record.

Senator JOHNSTON. I imagine that will be sufficient.

(The statement follows:)

STATEMENT OF E. H. AGNEW, PRESIDENT, SOUTH CAROLINA FARM BUREAU FEDERATION

I am E. H. Agnew, president of the South Carolina Farm Bureau Federation, a general farm organization with more than 21,000 member families. We appreciate this opportunity to make a brief statement to this committee on a subject that has been of deep concern to us for a number of years.

We believe that your report and recommendations will be of inestimable value as a basis for determining a sensible course of action, legislative and otherwise, designed to obtain maximum wise use of our water resources in meeting future needs of our growing population, our expanding industrial and agricultural development, and to bring about public understanding and support for implementation of a program of combined conservation and wise use. Such a program is undeniably a vital part of plans for sustaining a sound and expanding national economy and for improving the standard of living for the people of this country.

Despite the enactment of no less than 30 separate laws by Congress since 1866 clearly indicating the intent of the Congress to protect the right of States to control their water resources, recent court decisions and the policy of the Justice Department make it quite evident that Congress must take action to protect the rights of States and individuals, or the Federal Government will preempt the field of water rights to the point that States and individuals will find themselves strictly limited as to what they can do, or cannot do, with respect to the conservation and use of water resources.

We have long recognized the need in this State for putting into effect a program (1) to further guarantee to the State the right to control its water resources by setting forth by State law a procedure whereby the State could and would establish and protect the corporate and private and individual rights to the use of water resources, and (2) to protect water rights as property rights, and (3) to avoid, insofar as possible, the future penalty that is bound to be inflicted upon any State in which precious water resources have been lost, either through failure to conserve and use wisely, or by surrender through Federal preemption brought on partly by neglect of the State to exercise its right to control.

To develop such a program in this State would be of little value unless the Congress acts promptly to stop Federal preemption of the right to control water resources and restore this right to the respective States and protect it.

Our Farm Bureau voting delegates in annual convention assembled at Clemson last November adopted the following resolution: "We commend our general assembly for unanimous adoption of the joint resolution memorializing the President of the United States and the Congress to enact legislation protecting our water resources from Federal preemption. This is a vital part of States rights, and unless this trend toward Federal preemption is stopped or reversed, individuals and State governments may soon find that they have little rights left to the use of water or to the control of water resources.

"It is equally as important and as urgent that our general assembly take appropriate action looking toward adequate provisions for the handling, management and control of our State's water resources in the future as it is for the Congress to take action preserving or restoring the rights of States to control these resources.

"It is obvious that rapidly expanding needs and uses of water for domestic, municipal, industrial and agricultural purposes in years to come demands that immediate attention be given to wise and well-planned conservation and use of our water resources.

"Our general assembly should immediately give attention to this problem on a sufficiently broad and businesslike basis to guarantee the wisest and most beneficial possible use of our water resources in the future.

"The first step toward accomplishment of this objective is a comprehensive survey of our water resources, an estimate of the qualitative and quantitative needs for future use for various purposes. The 1961 general assembly should have this study and report as an aid in preparation of a sound basic water law."

The resolution quoted above clearly indicates that our farm people in this State understand that action on the part of our general assembly and action on the part of Congress constitute imperative needs that must be met if our State and Federal Governments may be expected to work together closely to the end that we may in the future reap maximum benefits from our water resources.

There is significant language in section 2 of Public Law 85-850 which provided for the establishment of the U.S. Study Commission on Southeast River Basins:

"SEC. 2. In carrying out the purpose of this Act it shall be the policy of Congress to (1) recognize and protect the rights and interests of the States in determining the development of the watershed of the rivers herein mentioned and their interests and rights in water utilization and control as well as the preservation and protection of established uses * * *."

This section indicates clearly that Congress recognizes the right of States to develop their water resources.

As president of this State's farm bureau organization, it has been my privilege for several years to be a member of the Resolutions Committee of the American Farm Bureau Federation—and twice a member of the subcommittee on natural resources. We heartily subscribe to the water policy of the American Farm Bureau Federation which is in part, "Federal participation in water development projects should be in cooperation with State and local interests. We are opposed to Federal domination of water resource development. We favor legislation to require Federal agencies (1) to comply with State laws relating to the use of water, and (2) to respect private rights to the use of water established by State authority. The right to use water is a property right which should not be taken from any person without due process of law and adequate compensation."

We are also heartily in accord with the current American Farm Bureau Federation resolution on watershed protection and flood prevention which reads in part:

"During the past decade Federal funds appropriated for downstream measures have vastly exceeded those made available for upstream protection and flood control measures. We recommend that an increased proportion of the total funds appropriated for water utilization programs be provided for planning, development, and construction of projects under the Watershed Protection and Flood Prevention Act".

We are not participating in the controversy pointed up in the Savannah River Basin between private and public power interests, but we quote this one sentence from the power policy of our American Farm Bureau Federation, "The entry of the Federal Government into the power business should be restricted to those instances where adequate development cannot be obtained otherwise."

Our organization does not have the research facilities to warrant us trying to be technical about the problems of surveying water resources, projecting needs for various purposes in the future, and making recommendations; but we are grateful for an opportunity to participate in one of the 20 hearings being held around the country by the Senate select committee. Since this select committee is composed of members from each of the four Senate committees having primary responsibility in connection with water resource legislation, it may be expected that the work of these four committees—Interior and Insular Affairs, Public Works, Interstate and Foreign Commerce, and Agriculture and Forestry—may be better coordinated through the work and influence of this select committee.

It takes little imagination to visualize vastly expanded needs for water—good water—in the years to come. It is estimated that the per capita consumption of water in this country will double in the next 25 years. No more water is being created. The supply is exhaustible.

Concentrations of people are to be limited by supplies available of good water. Industrial growth and expansion is likewise to be limited. There is a strong

trend toward shifting agricultural production to areas where water is plentiful for irrigation and away from areas where such supplies are not available.

Our South Carolina General Assembly continues to confer the right to use huge quantities of water for industrial purposes. Until recently, our general assembly raised no objection to the Federal Government acquiring complete control of substantial portions of our available water supply for purposes that certainly tended to restrict industrial and agricultural expansion and development in this State.

There can be no doubt that the future progress of South Carolina is dependent upon joint industrial and agricultural progress. Such progress means expansion and development in both industry and agriculture. Industrial and agricultural expansion and development add up to increased business activity.

An expanding population with increased business activity plus a doubled per capita consumption of water is certain to result in some water shortages in some areas or for some purposes within the next few years.

Neither our State government or the Federal Government is prepared to face up to this situation of impending water shortage, particularly in the 31 so-called humid States. Therefore, our State government needs to take immediate steps to find out how much water supply we have, how much of it we have already given away, what is left, and what can be done to guarantee that the remaining supply will be wisely conserved and used.

Then the necessary legal procedure must be provided to guarantee that this program of wise conservation and use will henceforth be applied to that portion of our water resources not already being lawfully and properly used. The State cannot put such a program into operation with confidence until Congress makes it clear that the State's right to manage its water resources will not be subjected to Federal preemption and domination.

Continued neglect on the part of our general assembly to provide for initiation of a sound program of management of our State's water resources (that part which now remains for allocation) does not justify but does tend to invite Federal preemption in this field of water resource management and control because this problem of conservation and wise use of both land and water resources is a problem that is national in both scope and consequence.

In order to place the primary responsibility for performance in this field upon the respective States as a right unchallenged, we urge that this Senate select committee exercise its leadership responsibility in the Congress to stop erosion of the constitutional right of States to manage their water resources. Such action would do two things—first, it would encourage States to assume their rightful responsibility and to take action to initiate a program of conservation and wise use of water resources and, secondly, it would place the responsibility for such programs directly upon the States where it belongs.

The CHAIRMAN. Does Mr. Crisp have a statement for us?

Mr. SCHAD. We do not have that.

Mr. MCBRIDE. I have not seen that.

The CHAIRMAN. All right.

Senator JOHNSTON. The next witness is Col. Harry E. Brown.

STATEMENT OF COL. HARRY E. BROWN, DIRECTOR, NORTH CAROLINA DEPARTMENT OF WATER RESOURCES, FOR GOV. LUTHER M. HODGES

Colonel BROWN. Thank you, Senator Johnston.

Mr. Chairman and members of the committee, my name is Harry Brown and I am the director of the Department of Water Resources for the State of North Carolina.

As long as you cannot meet in our State we are very glad you met down here.

The CHAIRMAN. Fine. We are glad to have you with us.

Colonel BROWN. With your permission, sir, I think I can summarize my statement in about 2 minutes. It is getting late.

The CHAIRMAN. We are not concerned about the time unless you are.

Colonel BROWN. No, sir, I am not.

We feel the next 15 or 20 years is going to be very critical in our State. At the present time we have enough water and very few of our towns and cities are hurting for water now. We believe, though, that this condition will not continue unless we use every effort we can to conserve and manage our water resources. We believe this could best be accomplished by the development of our river basins and by the development of our small watersheds under Public Law 566 as amended by 1018.

I think our State is third in the small watershed development. I believe Texas is first, Georgia is second, and we are third in the number of projects under that program.

We are very sorry that more funds have not been provided for the 566 program. I understand that about $3½ million this year will only permit about 32 new starts. We feel in our State that this is one of the best programs we have for the conservation of water. In the Cape Fear River Basin the Corps of Engineers is working hand in hand with the State to come up with a plan to utilize the water resources of the basin.

I believe this is the first time that I have ever heard of where the Corps of Engineers and the Soil Conservation Service will couple up with a joint report. We anticipate they will recommend the construction of retention dams upstream, and some smaller dams and then some larger dams on the main river. This report will be submitted, I believe, in August, and I am looking forward to it with a great deal of interest, and I think this committee should have a copy of that report when it is submitted.

As I say, this is the first time that I know of where the whole basin is administered by the corps and the Soil Conservation Service.

We have 16 major river basins in our area and we feel we can control the water and can conserve our water if we all work together. That is, the Federal Government, the State and local people. This job cannot be done, we believe, by the Federal Government or by the State or by the local people alone. We feel it has to be a joint effort, a nonpartisan one, and we have all got to forget our selfishness and work for the good of the whole area.

That is our belief in our State. We are moving ahead very fast in our water pollution program. At the present time, about 98 percent of the area has been studied in the water pollution program and about 66 percent of the streams have been classified. After a stream is once classified we give the industry and the town a certain number of years to come up with a pollution abatement method. It generally runs about 5 years.

We feel by 1963 that all of our streams will be classified, and we believe that most of our towns and most of our industry will have put their plans into effect by that time or shortly thereafter. We have to reuse this water over and over again and we feel we can only do that by putting the water back in the stream in about the same condition it was when we took it out. And we are working toward that goal.

Senator SCHOEPPEL. What progress have you noted in your State with reference to the requirement that you lay down for pollution abatement? Are they progressing as fast as you think they ought to?

Colonel BROWN. Yes, sir; with the exception of a few of the smaller cities that just do not have the money. They borrowed about as much money as they can under the present law. We feel that they must have some State help. We feel that the State must step in and help these people, maybe by a revolving loan fund or something like that. We feel that the Federal Government is not to bear all the burden in this but we feel it is a free thing, a partnership.

The CHAIRMAN. What is your feeling and that of the local people with reference to Federal law or Federal participation in the pollution abatement?

Colonel BROWN. We feel sorry that the Blatnik bill was vetoed.

The CHAIRMAN. Has your State had applications from the various communities in it to use up the allocations made available to it under the appropriations provided?

Colonel BROWN. Since the organization of that sewerage treatment water grant program, 47 towns of North Carolina have received Federal grants in the amount of $5,010,575 for construction of works. The total cost of these 47 projects amount to $22,318,849. That leaves a balance of $17,308,274 or about 77 percent of the construction cost that would be financed locally. The requests for grant funds have always been in excess by approximately $1¼ million over the amount allocated to our State.

The CHAIRMAN. Does that mean that is the accumulated total or is that the total, maybe, each year?

Colonel BROWN. That is the accumulated total as of right now.

The CHAIRMAN. Yes.

Colonel BROWN. This year we have on hand 46 applications, requests, totaling $6,146,436, or nearly $4 million more than our allocation. These projects represent construction costs of about $33 million and of this amount the Federal share will be about 18 percent and the local share 81 percent.

The CHAIRMAN. Do you feel that this grant by the Federal Government has proved to be an effective incentive to stimulate the participation in development of these projects by the local communities?

Colonel BROWN. I am absolutely sure that we would not have been anywhere near as far as we are now without that. I think it is a great incentive.

Senator JOHNSTON. Do you think a great many of the communities could not have afforded to just go into it themselves?

Colonel BROWN. I am positive of that. Also, the encouragement and the technical help that the Federal Government and State has provided has contributed a lot, too. I am sure this is an excellent program. We are sad the Blatnik bill was vetoed because we feel by 1975 or 1980 that our river basin studies must be completed and construction underway. We also feel by that time that all of our streams should be classified and that we should be able to return the water to the streams by that time in good condition. We feel we have just got a few years to work on it and we feel that these next 15 to 20 years are the critical years.

We feel that all these things help our fish and wildlife a great deal and our recreation program. We feel that the U.S. Geological Survey surface ground water studies are good. Our State has appropriated about $250,000 a year which is matched by the Federal funds

on the ground and surface water studies. We have 134 permanent gaging stations on our streams and about 400 that we use now and then. We hope to increase our ground water studies next year. We have ground water in our State and have lots of it. We are very fortunate that we have about 50 inches of rain a year.

The CHAIRMAN. How much?

Colonel BROWN. Fifty inches. We do have an awful lot of ground water. Although in our coastal areas where they use wells a great deal we are having some trouble with salt water intrusion. We are also hoping that the water saline program will work out where we can convert this water at somewhat around 30 or 40 cents a thousand gallons. We understand that sites for four plants have been selected and they will select another pretty soon. We feel that will be a great help to our area when that occurs.

We are a little bit worried about the definition of navigable waterways. There are so many definitions that nobody in our State knows what is a navigable waterway. We feel there should be a clear definition at the congressional level by Congress so that we will all know what we mean when we are talking about navigable waterways. That causes a lot of confusion in our State and I guess we all know the different interpretations which have been made to float a log; you know what it is. It is very confusing.

We are always a little worried by the great overlapping of water resources responsibility at the Federal level. There are about 25 agencies up there that have some degree of responsibility in this area and oftentimes rather confusing to us at the State level to know where to go to and you have to go to so many people on a lot of these prjects.

We hope very much that sometime in the foreseeable future we will have a Department of Water Resources at the national level like we organized at the State level. We had five or six State agencies that had a lot of degrees of responsibility in this water field. Being human, it is competition, this, that, and the other thing, the programs were not coordinated. So the governor was instrumental in having the legislation enacted last year that moved all of these responsibilities to one agency. It has only been in existence since September but working out very well indeed. We sincerely feel that something like that should be done at the national level.

That is about all I have, sir.

The CHAIRMAN. We are very much obliged to you, Colonel Brown, for a fine statement.

Senator JOHNSTON. Very fine. Very fine. Thank you, sir.

(The statement follows:)

STATEMENT OF HARRY E. BROWN, DIRECTOR, NORTH CAROLINA DEPARTMENT OF WATER RESOURCES

The purpose of Senate Resolution 48 as stated in a report issued by the Committee on Interior and Insular Affairs "is to provide the Senate with factual analyses and objective recommendations that it can use in taking legislative action on water resource programs."

The work of this committee, the legislation based on its findings and recommendations, will be of extreme importance to every individual in the Nation. Certain basic data and information with reference to the water problems of North Carolina and its plans to combat these problems have been transmitted to the committee. The opportunity to submit further comments for the consideration of the committee is appreciated.

If our country is to continue to grow and prosper, there must be an adequate supply of water of suitable quality at the right place and at the right time. Unless these conditions are met, a serious problem will confront each affected rural community, municipality, region, and State. These conditions can be met if the water resources of the various regions of the Nation are developed, conserved and better utilized. However, this will require nonpartisan and cooperative action at each level of government and the earnest and active support of private enterprise as it will be difficult, if not impossible, to accurately define the responsibilities each should assume.

Traditionally, the Federal Government has assumed primary responsibility for the development of the river basins of the Nation; for the control of floods; and for the development of waterways for commercial navigation. During the past few years the Federal Government also has been concerned with local flood protection; major drainage; small watershed treatment; shore and beach protection; fish and wildlife conservation; electric power generation and distribution; irrigation and land reclamation; pollution abatement; and storage of water for anticipated needs.

These civil works have been of great benefit in the field of water-resource development. Too often, however, they have been undertaken without due consideration for the effect they may have on expanding agricultural, municipal and industrial development. Also, there appears to be an increasing doubt, in some quarters, as to whether the benefits to be derived from such works are worth the cost. This is due to some extent to the rigid benefit-cost ratio formula that has been developed by various agencies of the Federal Government to determine the economic justification of proposed projects. It is believed the benefit-cost ratio formula should give more consideration to the increased local, regional and national productivity, including recreational facilities and fish and wildlife protection, that will result from a well-planned, coordinated water program.

Assuming the water needs of the Nation will increase by 200 percent by 1980, it is essential that immediate action be taken at every level of government, and by business enterprise, to conserve and develop the water resources of the Nation, regardless of the cost involved.

This action is necessary as precipitation is relatively constant. The Department of Health, Education, and Welfare estimates that the fixed amount of precipitation averages about 4,300 billion gallons per day; that 70 percent, or 3,100 billion gallons, is returned each day by evaporation and transpiration; and that 30 percent, or 1,200 billion gallons, is theoretically available for all water needs. However, a large portion of the supposedly available amount occurs as floodwater which quickly runs off to the ocean. Also, experience indicates that it will take from 10 to 20 years to plan and construct even small civil works projects.

The following sections discuss aspects of water-resource programs which the State of North Carolina suggests the committee might profitably explore. These sections are intended to supplement the material submitted previously at the request of the chairman.

RIVER BASIN DEVELOPMENT

Our water resources can be conserved and developed by preserving and utilizing the land and water resources of the river basins of the Nation. The Federal agency primarily concerned with this phase of water conservation and development in the Southeastern area is the U.S. Army Corps of Engineers. The corps has authority, or authorization can be secured, to conduct comprehensive studies of river basins to determine the most suitable plan of improvement for flood control and other allied purposes. However, this process is slow, due primarily to lack of sufficient Federal funds for planning and construction and, in many instances, to a lack of cooperation at the State and local levels.

Future requirements of water for present or anticipated agricultural, municipal and industrial purposes should be determined during the study phase of river basin development. Plans also must be developed that will permit better use of the land area for agricultural, municipal, and industrial growth. Land-use planning should go hand in hand with the river basin programs under study by the Federal Government.

The State and local political subdivisions, as well as private enterprise, must participate in the development of river basin programs particularly in the land-use phase. The requirements for the non-Federal share of the cost of

construction, as well as for other purposes, must be made available at the State or local level.

It may be fairly stated, I believe, that the Corps of Engineers advocates the use of large multipurpose reservoirs, constructed to withstand the most severe flood conditions of record. The Soil Conservation Service, on the other hand, prefers the use of small upstream reservoirs to reduce damage caused by yearly or frequent floods. This difference of approach, in some instances, may result in undue delay in the completion of plans. However, the matter usually can be resolved at the local levels.

This committee may desire to give consideration to a program, adequately financed, that will result in the completion, by 1975, of comprehensive plans for the development of the major river basins.

THE WATERSHED PROTECTION AND FLOOD PREVENTION PROGRAM

The Congress, by the enactment of Public Law 566 in 1954, adopted a policy of Federal cooperation with States and local political subdivisions in the conservation, development, utilization and disposal of water in the small watersheds of the Nation.

This program permits the development of the land and water resources in an area where assistance from the Federal Government is required in establishing watershed protection, as programs for this type of improvement were not available at the State or local levels.

The benefits to be derived from such projects would be considerably increased by constructing and operating them in such manner as to provide for adequate streamflows, particularly during periods of low flow. The adding of these provisions to projects would make it possible to develop the full potential of reservoir sites and improve the quality of water under regulation. This is particularly important to fish and wildlife protection; to municipal and industrial water supplies; to the protection of public health; and the recreational use of water.

As the benefits mentioned in the above paragraph are difficult to define, the committee may desire to give consideration to proposing an amendment to Public Law 566, as amended, to authorize the Soil Conservation Service to include this element as a financial responsibility of the Federal Government. The committee also may desire to give consideration to recommending that adequate funds be made available to permit the completion, by 1975, of small watershed programs for the small watersheds of the Nation.

WATER POLLUTION CONTROL

The abatement and control of pollution constitute one of the most important phases of any program for the conservation, development, and utilization of water resources. Inasmuch as the available water supply is constant, its quality must be maintained in such manner as to permit its use and reuse.

The prevention and control of water pollution are the primary responsibility of States and local governmental units. Industry should assume full responsibility for treatment of its wastes so as to permit reuse of water without injury to public health or to the fish and wildlife resources of the Nation. The Congress has time after time reaffirmed this concept. However, the Congress, by enactment of the Water Pollution Control Act of 1948, and through subsequent amendments in 1956, recognized that the Federal Government also has a degree of responsibility in this area. The programs authorized by these acts have established a good foundation for solving complex pollution problems at the local, State and National levels.

Limited research in the water pollution area is now being conducted by the U.S. Public Health Service at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. An expanded research program is of primary importance to the conservation of the quality of the Nation's water resources. The introduction of new and more complex wastes being brought about by our rapidly changing industrial products indicates that unless major technical breakthroughs with respect to waste treatment are achieved, an increased portion of the Nation's water resources will become unsuitable for use, even with the full application of our present-day knowledge of sewage and industrial waste treatment.

The committee may desire to give consideration to endorsement of legislation that will:

1. Amend that section of the Federal Pollution Control Act, substantially as contained in H.R. 3610, authorizing increased assistance to municipalities for the construction of sewage treatment works; also, associated amendments to improve the administration of this program.

2. Extend the provisions of section 5 of the Water Pollution Control Act, due to expire June 30, 1961.

3. Provide for the expansion of the research program now being conducted by the U.S. Public Health Service.

4. Provide adequate grants to State agencies and universities for research activities.

5. Permit industry to rapidly amortize, for tax purposes, the capital investments required for waste treatment facilities.

FISH AND WILDLIFE PROGRAM

River basin and small watershed program planning should give greater consideration to the protection and maintenance of the fish and wildlife resources. This objective can be achieved by the provision of adequate streamflows, particularly during periods of low flow, and by the establishment of pollution control measures.

The program cannot be effective unless there is cooperative action at the State and local levels. Industry, too, must assume its share of responsibility in this area.

The Federal Government, by the enactment of the Pittman-Roberson and Dingell-Johnson Acts, recognized that the conservation and preservation of suitable fish and wildlife habitat is in the public interest and considered to be a primary beneficial use.

It appears these resources have not always been given full consideration in establishing the benefit-cost ratio when flood-control reservoirs are being planned.

The committee may desire to give consideration to reaffirming the present grant-in-aid policy; also, the establishment of a Federal policy that will define the degree of Federal and non-Federal participation in the cost of that portion of the project allocated to fish and wildlife purposes.

RECREATIONAL PROGRAM

River basin and small watershed program planning should give greater consideration to the recreational features that will be of benefit to the people and that are recognized as a primary beneficial use. These plans should include a land-use study, with certain areas reserved for recreational purposes. Also, plans should provide adequate streamflows and should minimize water level fluctuation in storage reservoirs.

The recreational program in river basin and small watershed projects cannot be fully developed without cooperative efforts at the State and local political subdivision levels. Industry, too, must cooperate providing pollution control measures.

The degree of Federal and non-Federal financial participation in civil works projects that have a recreational benefit is difficult to define. Under existing Federal policy the maximum Federal contribution for recreational-purpose shall not exceed 15 percent of the cost of the project.

The committee may desire to give consideration to proposing a Federal policy that will define the degree of Federal and non-Federal participation in the cost of that portion of projects allocated to recreational purposes.

COOPERATIVE FEDERAL-STATE PROGRAMS

The following Federal-State cooperative programs have contributed a great deal in the field of water-resource conservation and development:

1. U.S. Geological Survey surface-water, ground-water, and chemical studies.

2. Shore protection projects—authorized by Public Law 826, 84th Congress, 2d session.

3. Methods to minimize damage to coastal areas caused by hurricane winds and tides—authorized by Public Law 71, 84th Congress, 1st session.

4. Local flood protection projects—authorized by section 208 of the Flood Control Act of September 3, 1954.

5. Local flood protection projects—authorized by section 212 of the Flood Control Act, as amended by Public Law 685, 84th Congress.

The committee may desire to give consideration to recommending these programs be continued at an accelerated rate.

OVERLAPPING OF RESPONSIBILITIES

Approximately 25 Federal agencies have a large degree of responsibility for various areas in the field of water-resource development. Other Federal agencies are concerned to a lesser degree. There appear to be overlapping and divided responsibilities in the Federal structure, as well as some interagency competition. Also, proposed legislation in the field of water-resource development is considered by a number of congressional committees.

This identical condition, to a lesser degree, is found in many of the States' governmental structures.

As an example, several departments and agencies of the State of North Carolina had some degree of responsibility in the field of water-resource development. There was overlapping of responsibilities and a lack of coordination of the various plans to conserve and develop the water resources of the State that were being proposed by the interested agencies.

After several years of study by the Commission on Reorganization of State Government, legislation was enacted in 1959 creating the North Carolina Department of Water Resources. All responsibilities in the development and conservation of water resources were transferred to that department. It can be demonstrated that, in the short time the new State agency has been in existence, the action of the general assembly in creating the department was a wise one.

At the present time the Federal Government does not have a single uniform policy governing the comprehensive development of land and water resources. Federal commission after Federal commission, as well as various study groups, have proposed the creation of some agency, at the Federal level, that would be responsible for the formulation of policies; for providing an independent nonpartisan review of water-resource projects proposed by the various federal agencies; and for conducting and analyzing basic hydrological and other data which is necessary in the determination of the technical feasibility of water-resource projects.

The committee may desire to review reports concerned with the conservation and development of the water resources of the Nation such as the ones submitted by the President's Water Resources Policy Commission, Commission on Organization of the Executive Branch of the Government, and various study committees' reports, with a view to determining the feasibility of establishing a Federal Department of Water Resources.

FEDERAL-STATE RELATIONSHIP IN THE FIELD OF WATER-RESOURCE DEVELOPMENT

The development of the water resources of the Nation is dependent upon nonpartisan objectives, cooperative action, and participation at every level of government. This cooperation, in many instances, has been difficult to achieve as a large segment of the public sincerely believes it is the intention of the Federal Government to assume jurisdiction of all the water resources of the Nation. Much of this trend of opinion is based on the theory that every stream is navigable and comes under the Federal Government's control over navigable waterways. The "general welfare" clause of the Constitution and the provisions contained in section 26a of the Tennessee Valley Authority Act, also have been used on occasion to the apparent benefit of the Federal Government without due consideration for the interest of the State.

The Congress has repeatedly affirmed that national water-resource policy and procedure should conform to the water laws of the respective States unless interstate commerce is involved. However, numerous decisions of the U.S. Supreme Court, as well as decisions of Federal administrators concerned with the development of water resources, have been in apparent conflict with the stated policy and have caused great concern to officials at the State and local levels charged with identical responsibility. The water resources of the Nation will never be developed to their fullest extent until and unless the rights of the Federal Government, as well as those of the States, are clearly defined by legislative action.

The committee may desire to give consideration to proposing legislation that will clearly define the rights and responsibilities of the States and Federal Government with respect to the control and use of the water of streams that are nonnavigable in fact. Also, consideration may be given to the desirability of legislative action that will clearly define the rights and responsibilities of the States in the field of water-resource conservation and development.

Senator JOHNSTON. The next witness, Mr. K. C. Dodson, director of research and legislation, Tennessee Farm Bureau Federation regrets that he cannot be present but asks that his statement be made a part of the record.

The CHAIRMAN. His statement will be made a part of the record.

(The statement follows:)

TENNESSEE FARM BUREAU FEDERATION,
Columbia, Tenn., May 3, 1960.

Senator OLIN D. JOHNSTON,
Senate Office Building,
Washington, D.C.

DEAR SENATOR JOHNSTON: Last fall I wrote you in regard to an appearance before the Senate Select Committee on Water Resources at the hearing scheduled for Columbia, S.C. You notified me of the postponement of the hearing from the December 2 date and recently notified me of the rescheduling of this hearing for May 13, 9 p.m.

I appreciate very much your courtesy in keeping me in mind and notifying me as to developments relative to the hearing. However, I find that I will not be able to be present at the hearing on May 13 and would appreciate, therefore, if you would permit me to submit my statement to you for filing with the record of the hearing. We in Tennessee are very much interested in the subject of water resources and their development and wish for your committee a most profitable hearing and discussion of this topic so vital to our future.

Proceeding on the basis that you will file my statement with the record of the hearing, I am enclosing 10 copies. I do not know how many copies you will need, therefore, have taken the liberty of estimating 10. In the event this is not in order if you will let me know, I will do my best to comply with your request.

Yours truly,

K. C. DODSON,
Director, Research and Legislation.

STATEMENT OF TENNESSEE FARM BUREAU FEDERATION

The subject of water resources is one of direct and vital interest to farm bureau members in Tennessee, and in fact to all Tennesseans. The Tennessee Farm Bureau Federation has a membership of over 63,000 voluntary dues-paying farm families, all of whom are affected by actions to conserve, develop, and use the water resources which we have. May we thank this committee for the opportunity to express the views of our members on this most vital topic.

We would certainly like to commend the Senate and this committee for their farsightedness in beginning these studies on the water resource needs of our Nation for the future. Commendations are also in order for a recognition of the need for coordination of legislative responsibilities in the water resource field that the most might be accomplished in water resource development and conservation.

We in Tennessee are most fortunate, waterwise, in many respects by virtue of having very good rainfall and in most areas adequate underground supplies of water. Yet, with this good fortune, we, like all other areas of this Nation, have the problems which are created by an expanding population, an expanding economy, growing industrial communities, and the progressive application of irrigation technology on our farms. All these bring pressure for an increasing supply of good, clean water.

Our problems, like others of the humid eastern areas, are those of too much water at certain times of the year in some areas and too little at other times of the year in some areas. These factors, coupled with the occurrence of some unusually dry seasons in recent years, makes Tennessee conscious of the fact that major water problems are developing. As a result, discussions began as to what Tennessee could do to conserve its water resources and prevent the oc-

currence of a water shortage. Let me hasten to add that since those drought years, our most recent years have given us ample rainfall and distribution so that the acuteness of the situation has been alleviated. Thus we have been permitted to study our situation without pressure for emergency action.

Tennessee, cognizant of its obligation to its citizens in the field of water and water resources, and its duty to insure its citizens the continued right to use water and to protect their investments made in development and control, took action through the Tennessee General Assembly in 1955 to establish the Tennessee Water Policy Commission. This commission was established for the purpose of making a comprehensive, statewide study of Tennessee's water resources and needs. As a result of this study, the 1957 session of the assembly continued the commission and its studies and provided sufficient funds for the employment of a staff of engineers and geologists. Although changed in title to the division of water resources, Tennessee now has a permanent division and staff for continuing the inventory, study, and development of recommendations for State legislation to meet the needs of the people of Tennessee in the field of water, water rights, and water resources. This we believe to be our State's responsibility to our citizens.

As to Tennessee's situation, the Water Policy Commission Study Report of 1956 contained these comments:

"One of Tennessee's most important natural resources is its abundant water supply. If the total water crop in Tennessee were uniformly distributed over the State during the different seasons of the year there would be little difficulty in assuring an adequate water supply for all different requirements in the foreseeable future. However, there is substantial variation between minimum and maximum water yields from one year to another; and within any 1 year there is significant variation in water yields from one season to another. In 5 out of 7 years, on the average, droughts of 21 days or more, with less than 0.25 inches of precipitation for the entire period, have occurred during the late summer and early autumn. This is the period of maximum temperatures when moisture is critical to the maturing of agricultural crops. As a result, irrigation has expanded at a rapid rate to alleviate drought conditions on Tennessee farms. Other consumptive uses including municipal and industrial water supply, which have greatly expanded during periods of recent economic growth, also reach their highest level of demand during the drought season.

"Thus, the period of minimum water yield coincides with the maximum water demand. Whenever the demand approaches or exceeds the available supply, water shortages occur with their adverse consequences upon the prosperity and welfare of the State. The community confronted with water shortages either faces economic stagnation or must invest in the necessary waterworks and facilities to prevent future shortages by storing surplus water during periods of excessive runoff.

"The basic problem confronting any people experiencing water shortages is to facilitate fuller utilization of surplus floodwaters. Investment in waterworks can be looked upon as creating a reserve fund in a water "bank" to meet requirements during periods of minimum or low natural flows.

"Total withdrawals of water in Tennessee should be expected to increase to about 13 billion gallons a day by 1975. This assumes the same rate of increase for each of the uses, except irrigation, as is expected in the Nation during the same period. Only for irrigation will Tennessee probably have a greatly different trend in water use than the Nation. As estimated by the President's Materials Policy Commission, water use in the United States in 1975 will be 189 percent of what it was in 1950. In Tennessee the 1975 use is likely to be over four times what it was in 1949. The difference between Tennessee and the U.S. rates of increase is due to the fact that one of the most rapidly growing sectors, industry, is more heavily represented in Tennessee, and to the further situation that for the United States irrigation is large and relatively stable.

"Well in advance of 1957 it will be necessary to make preparations for the decades after that. If the anticipated rates of increase in manufacturing, steam power, irrigation, and other uses of water continue to the year 2000, then over three times as much water will be used at that time as the 12,750 million gallons a day shown for 1975. It is this order of use for which there will have to be some preparations before 1975 so that the legal and administrative machinery of the State will be equipped to deal with the problems most likely to arise."

This study report clearly points up some of Tennessee's water problems and how we, like the rest of the Nation, are rapidly expanding the uses of what

water we have. These statements were made in 1956. Today, 4 years later, we can see how rapidly we are moving toward some of these anticipated huge demands for water.

The Tennessee Valley Authority through its multiple or varied programs of navigation, flood control, power, recreation, reforestation, and land use have demonstrated the many advantages and benefits of a complete program of water conservation and development. Public Law 566, the Small Watershed Development Act, is a rapidly growing and well-liked program in Tennessee and recognized as a primary step in a real soil and water conservation program. We believe, and we feel sure that the members of this committee recognize that for the greatest conservation of our water resources, we must begin up in the watershed where the water falls by storing the maximum possible in the soil. Other measures, such as downstream reservoirs are supplemental to this storage and aids to navigation, flood control, irrigation, recreation, and other water resource use and development. We cannot make more rain fall but we can make plans to save and use that which does fall. To develop and conserve these resources for 1980 and the years beyond, and as a policy for the orderly development of our water resources, we suggest we begin putting emphasis on upstream watershed development and work downstream as the water does on its run to the sea. This is the place to put the ounce of prevention if we expect to get that pound of cure.

As we discuss and plan water resource development and conservation for our future as a nation, we must not lose sight of the fact that water is property and as such the right to own and use should be treated the same as the right to own and use any property. In recent years there have been indications by court decisions and administrative actions that all water and water resources are the property of the Federal Government rather than the States and individuals. Such a theory as this is not acceptable to Farm Bureau members nor the people of Tennessee.

This is evidenced by the adoption of Joint House-Senate Resolution 45 by the 1959 session of the Tennessee General Assembly. This resolution urged the Congress to preserve the rights of the States and individuals to water, to treat water rights as property rights, and to protect these rights by legislation. S. 1416 on water rights, and now before the Senate, would accomplish this and we favor its early adoption. If we are correct in our review of history, Congress has had and has demonstrated its responsibility many times down through the years by legislating on water rights in such a manner as to assure that States and individual rights in this field would be recognized and protected. We urge this committee to keep this thought in mind in consideration of all water resources development programs and water legislation.

The manner in which we conserve, develop, control, and administer our water resources may well determine the future of our economy and perhaps even the destiny of our Nation. Water is a resource essential and vital to every person. As we plan for conservation and development of this resource to assure our America of the future an adequate supply of good, clean water, let make haste—but slowly and wisely.

In addition to recommendations stated earlier, and in conclusion, may we encourage this committee to consider and recommend the coordination of all water resource conservation and development programs so as to avoid duplication and waste and to get the greatest amount of conservation and development for the most people for the money invested.

We thank the committee for the privilege of presenting these views.

Senator JOHNSTON. The next witness is C. R. Johnson, Secretary of the Anderson County Planning and Development Board.

The CHAIRMAN. All right, Mr. Johnson.

STATEMENT OF C. R. JOHNSON, JR., SECRETARY, ANDERSON COUNTY PLANNING AND DEVELOPMENT BOARD

Mr. JOHNSON. Mr. Chairman, my name is C. R. Johnson, Jr. I am a member and secretary of the Anderson County Planning and Development Board, an agency created by an act of the general assembly of South Carolina.

This statement is supported by the Anderson Chamber of Commerce, and relates principally to Anderson County, but applies equally to the entire Savannah and Santee watersheds in the northwest third of South Carolina.

Until recent years, the area we represent was predominantly agricultural and its industries were largely those related to agriculture. In two or three decades, due to conditions beyond our control, agriculture in our area has ceased to be a base upon which a sound economy can rest. We can preserve our economy, we can provide earnings for our people and jobs for our children as they nature, only if we can expand industrially. Many types of industry need, and are attracted by, supplies of fresh, raw water. It is, therefore, in our interest that our waters, in excess of the amounts needed for municipal, domestic and agricultural purposes, be made available for industry.

Only a few water-using industries incorporate substantial amounts of water in their products. Most of them need water either for cooling or for waste disposal, and industries of both types require flowing streams rather than impounded waters. In the case of water used to cool steam plants, the warmed water must flow so as not to be recirculated in the cooling equipment. As an illustration, both South Carolina Public Service Authority (Santee-Cooper), a public power enterprise, and South Carolina Electric & Gas Co., a private power company, in building large steam electric generating stations, located them not on lakes which they owned, but on the stream below their hydroelectric plants.

In the case of waste disposal, flowing waters are even more essential. The capacity of a flowing stream to absorb the wastes that pass waste treatment plants is much greater than the capacity of still waters of equal volume. We are not condoning stream pollution. South Carolina's laws permit no stream to exist in a condition injurious to fish life, and most of our waters must be maintained in a condition suitable for domestic use after treatment. Flowing streams can absorb certain industrial wastes after economical treatment and meet these standards. Impounded waters cannot.

In our immediate area, we are greatly disturbed by the announced plans of the Corps of Engineers, U.S. Army, to construct two more hydroelectric developments on the Savannah River, and thereby impound waters along a 27-mile stretch of the river on the western boundaries of Anderson and Abbeville Counties. This will take from us our last remaining stretch of flowing water of substantial size. No valid reasons are advanced for these projects in our opinion. They are not needed for navigation. They are not needed for flood control. They are not needed for recreation and will be harmful to wildlife. They will not attract industry or bring prosperity. We cite in evidence census figures just released showing that the South Carolina counties adjoining Clark Hill Reservoir lost in population in the decade just ended, while other counties in the Piedmont area gained in population. The electric power they will produce is insignificant considering the total demand. Their construction may prevent the erection of a privately owned and tax-paying steam electric plant that will produce 25 times as much power if it can use the cooling capacity of the flowing stream.

The plans of Duke Power Co. to build such a plant, if Congress permits, will be, or has been, discussed by other witnesses. Mead Paper Co. owns a site and plans to build a mill at another point along the river. Its site will become unusable for the purpose if the Federal dams are built. These two plants will call for the expenditure of over $300 million and there is every reason to believe that other water-using industries will build along the banks of the flowing stream.

The impact of these plants on our local and State economy will be tremendous. And, incidentally, the Federal Government will collect an estimated $9,240,000 in direct income taxes from the power company alone annually. The hidden taxes and all the individual taxes that will be paid to the Federal Government by the people who will be employed directly and indirectly by these two plants, if they are allowed to be built, is undetermined but would be a very large amount.

Here exists a situation where private capital will develop a river to its highest and best use, and contribute substantial payrolls and taxes to the economy of the area. We do not ask for the appropriation of Federal funds. On the contrary, we are asking that Federal appropriations be withheld.

We recommend that the water-use policy for the southeastern part of the United States recognize the need for flowing rivers for industrial uses. Specifically, we request that the Congress withdraw that part of Savannah River below Hartwell Dam and above the backwaters of Clark Hill Reservoir, from the domain of the Corps of Engineers, U.S. Army, and make it available for development by private, payroll-producing, tax-paying industry.

Thank you, sir.

The CHAIRMAN. Thank you, Mr. Johnson.

Senator JOHNSTON. We certainly appreciate your coming.

Mr. JOHNSON. Thank you, sir.

I have a statement here of Ralph J. Andrews, director of the North Carolina Recreation Commission, and he asks that this become a part of the record here. It is two pages.

The CHAIRMAN. Very well.

(The statement follows:)

STATEMENT OF RALPH J. ANDREWS, DIRECTOR, NORTH CAROLINA RECREATION COMMISSION

There is a general awakening as to the great importance of recreation in the formulation of the future of society through the satisfaction of creative, personal and fitness needs of our people. There is, however, an appalling lack of understanding as to the recreation potential in its effects upon the economic future of this country and of the tragic results which cannot be avoided if adequate steps are not, soon, taken to assure the acquisition, preservation, development and use of land and water areas fitted to the satisfaction of the needs of public, planned recreation.

It is time, therefore, for the creation of an official Federal recreation agency which can and will view the whole perspective of all recreation needs, do research and counseling on Federal, State and local levels, and act as a clearinghouse and as a qualified interpreter of specific recreation needs in proper relationship to all others. This agency will serve just as agricultural, health, welfare and other Federal agencies do in their several areas of citizen need and will help to assure a balanced recreation service that cannot be achieved through, only, interagency committees drawn from agencies set up for nonrecreation purposes or from other secondary or tertiary recreation techniques. Such a recreation-

based Federal agency can be an interpreter of general and specific recreation needs as to water resources as well as to other recreation needs of our country.

Insofar as the present and future recreation need for water resources is concerned it may be well to look at some of the immense changes which have come about in the past few years. Any prediction of a few years ago, even that which would have been considered as wildly overenthusiastic, has been passed by, many times over, by the growth of the boating, aquatic, family camping and other water-associated recreation activities.

Other predictions than those for recreation, as to water needs, although in lesser degree than those of water-based recreation, have been outstripped by actual developments. No set formula, therefore (from even the best minds, based on the most complete historical data available and interpreted by top-flight prognosticators), anticipated present and, now, predicted future water needs of our country. This points out an important proposal which, in both land and water, must be interpreted into a pattern of Federal action if the important basic water consumption needs and the added recreation-economic and other additional water needs and wishes of the people of this country are to be satisfied, with a minimum of undesirable restriction and denial.

We recognize that these facts of experience show that this pattern cannot be set entirely upon the base of historical developments nor rested upon the best, most scientific predictions which will be made by the numerous aspects of Federal agencies which, each, have in mind a portion, but not all of the Nation's water needs and potentials for service in the common interest.

All of these present resources, we hasten to add, must be used but the past has proven that, in them alone, we do not have enough of help to assure the protection of the water interests, in the commonweal. We must have these facts, we must develop careful projections but we must, also, develop the means to get them; to do research, to coordinate all facts, to acquire an overall perspective in which the Congress of the United States has justified confidence and upon whose recommendations Federal legislative and Executive actions, as to water conservation, development, and use, can be securely based. We do not have such an agency now so we suggest that it be created.

It will be helpful, no doubt, to acquire a vast sum of opinions from every State, specifics (however restricted to the boundaries of the several States they may be) as to their own water problems and as to their opinions in regard to present and future water needs. It is a long, long step, from the accumulation of even the realistic draft of present national needs, to the creation of a national water policy. Between the data summary and the effecting of a practical national water policy is a gap beyond the reach of a study committee, no matter how dedicated its members.

To bring about the necessary, long-range, suggested adaptations (which only experience, growth and actual facts of developed need, added to data and opinions, will fully demonstrate) is far beyond the most wishful thinking in regard to the ability of such a committee.

A staff is needed, of permanently assigned, technically prepared experts, in which the basic job assignment is to gain the national perspective as to all water needs and to recommend action to the proper legislative and executive bodies, for coordinated consideration and action, if any national water policy is to be kept thoroughly alive, properly adapted and realistically (not facetiously) "fluid."

This is not the first time we have made this suggestion to which we continue to give our strong support.[1] Within pages 346–353 of this report is incorporated

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[1] As suggested before a special subcommittee of the Committee on Government Operations, House of Representatives, 84th Cong., and as reported in the published record entitled "Commission on Reorganization of the Executive Branch of the Government (Water Resources and Power Report, Pt. 2—Raleigh, N.C.)," and as detailed on pp. 346–353, statement by Ralph J. Andrews, director, North Carolina Recreation Commission in this report.

We believe that if all facts, as to economic and other data, experience and predicted future recreation needs for water resources, are taken into proper account and if logical action (as to legislation and other steps) is rested upon these facts, if these things are done, water resources will be properly reserved, developed, and used for recreation purposes. We believe, in other words, that the national recreation need for water should, and can safely do so, rest its case upon the sound base of factual data and logic and that recreation will gets its logical portion of the whole if all other aspects of water actions must face the same measures of logic and common interest. To help secure this base of factual, logical base of data, experience, overall need, and suggested action we propose a Federal water advisory service, as explained in the report, pp. 346–353, to which reference was made earlier in this paper.

our suggestion as to the best and most economical method to establish a service which will provide overall data upon which to intelligently rest a living water policy and in which all aspects of national need are incorporated as determinants of national action.

To establish such an agency does not mean that vested authority and power be taken, necessarily, from any other agency for (if it is developed as suggested) factual data and logic would be its only regulatory power.

It would be possible, then, to bring the whole perspective of national water needs into consideration each time that limited interests attempt to apply pressure for action in the interest of the few, unless such would not undesirably, condition those of all citizens. Many times, thus, limited water interests could, then, be confidently served when, without full data, information and without unbiased, overall, authoritative opinion such interests might be passively, or actively resisted.

Senator JOHNSTON. Mr. Chairman, that is all the witnesses that have signified they wanted to be heard here today unless there is someone else in the audience that has come for that purpose.

Mr. WALSH. Mr. Chairman, and members of the committee, I am W. C. Walsh, member of the Congaree Navigation Study Committee and we have a report that we would like to submit for the record, please, sir.

The CHAIRMAN. It will be filed with the committee, but not made a part of the record.

Mr. WALSH. Yes.

Senator JOHNSTON. Is there anyone else that has anything they would like to file with the committee at this time?

It is generally customary, I think, to leave it open for about a week.

The CHAIRMAN. We will be glad to leave the record open for 10 days and if anyone has any statement that he wants to put into the record or material to file with the committee, it may be transmitted to us through Senator Johnston.

Mr. HANNA. R. E. Hanna, president of the South Carolina Economic Association. I have made about 2,000 studies in about 40 years on water and so forth and I will give them to Senator Johnston.

Senator JOHNSTON. Glad to have them.

Anyone else?

If not, that completes the witness list.

The CHAIRMAN. I would like to congratulate the people of South Carolina on this fine presentation of information and viewpoints and beliefs. It makes a valuable contribution to the information which this committee has been assembling. We appreciate it.

Do you have any statement, Senator Schoeppel?

Senator SCHOEPPEL. No, Senator Kerr. I concur in your remarks and I think it has been a splendid hearing and furnishes for some of us not well acquainted with this area the opportunity to see what some of your problems are and what you are doing down here. I think it has been a splendid thing for this committee, for the committee record.

The CHAIRMAN. Senator Martin?

Senator MARTIN. The statements made here this morning will be a very real and valuable addition to our comprehensive survey for the entire country. It was a very real privilege for me to get down to Senator Johnston's home State and be a member of the committee to listen in on these hearings.

I want to compliment Senator Johnston for his work in getting the material together here. I know it has been done a little bit under your assistance, considerably.

The CHAIRMAN. Senator Johnston and Senator Thurmond both made contributions for the development of this hearing. We are grateful to them. Do you have any statement further, Senator Johnston?

Senator JOHNSTON. I have nothing further to say. I appreciate all the remarks that have been made. I, of course, am certainly glad to have the three Senators that I have with me here today. Senator Kerr sits right close to me in the Senate. Senator Schoeppel is on the Agriculture Committee with me and has been for many years. I can say one thing, we vote together, I think, practically on every issue in there. And then, speaking of Senator Martin, he is serving on my Committee on Post Office and Civil Service and we work together almost like a team in that committee. So I am certainly glad to have you down in my State and I know the people here are glad to have you here and they are glad to furnish you with this information concerning the problems that we are facing in South Carolina.

Senator SCHOEPPEL. Before you close the record here I might say that my association with the Senators in the Senate from this great State, I have the privilege as the senior Senator Johnston said here, of serving with him on the Agricultural Committee, which has been a very fine privilege. I also served with Senator Thurmond on the Interstate and Foreign Commerce Committee of the Senate, which is important in a great many respects to many of your projects down in your State here. That is why I am doubly glad to get down here. I would like to come back sometime when I do not have to work.

Senator JOHNSTON. Some day next week we will have to take up on the floor of the Senate the wheat bill which I reported out of the committee.

Senator SCHOEPPEL. That is right.

Senator JOHNSTON. And that being so, the committee was not all unanimous, you know, in that. Again I voted with you and I will have to help handle the wheat bill for the wheat growers, so I will have to lean on the Senator a great deal in the Senate when that bill comes up.

Senator MARTIN. I intended to add Senator Thurmond also in my remarks. He and I started our services in the Senate together 6 years ago. I served with him as well as Senator Johnston.

The CHAIRMAN. I enjoyed everything I have seen in South Carolina—progress, growth, development, great Senators, fine people. I especially was impressed by the evidence of progress I saw yesterday in the form of some very fine black cattle. I think that it is a wonderful thing to see this great State moving ahead in that manifestation of progress and growth.

Senator JOHNSTON. You know the need for water was a starting factor of that, too. When others had drought cattle were brought into South Carolina. We had more water and they were brought in here so they could get something to graze on and they just stayed ever since.

The CHAIRMAN. The committee will close this hearing at this time. We will stand in recess. If there are additional statements they will be submitted to Senator Johnston.

(Whereupon, at 12:40 p.m., Friday, May 13, 1960, the hearing was closed.)

(The following matter was presented to the committee:)

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY (SANTEE-COOPER)

Moncks Corner, S.C.

WHITMIRE, S.C., *May 10, 1960.*

Hon. OLIN D. JOHNSTON,
Columbia, S.C.

DEAR SENATOR: I wish to thank you for your kind invitation to attend the "National Water Resources" hearing in Columbia, Friday, May 13.

Would like very much to attend the meeting but due to a recent illness will be unable to attend hearing.

I hope you will have a fine meeting and much good will come out of same.

With kind regards and best wishes, I am,

Sincerely yours,

MARVIN E. ABRAMS.

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